Town of Morrisville
Master Sustainability Plan

**Adopted
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Glossary of Acronyms

BAS (Building Automation System) - monitors and controls a building's heating, cooling, ventilation, and lighting systems, which reduces building energy use.

CH_4 (Methane) – Methane is one of the greenhouse gases contributing to the greenhouse effect and climate change. It is both found in nature and created by human activities. Within greenhouse gas characteristics, methane is 28 times more potent than carbon dioxide over a one-hundred-year time span.

CO_2 (Carbon Dioxide) – Carbon dioxide is one of the most predominant greenhouse gases contributing to the greenhouse effect and climate change. Carbon dioxide is created when fossil fuels are burned to generate electricity and provide transportation.

CO_{2e} (Carbon Dioxide equivalent) - a calculation which combines the emissions for each greenhouse gas using the emissions factors for each gas so that each is weighted against carbon dioxide.

EE (Energy Efficiency) – EE is using less energy to get the same job done. Buildings can be inefficient. Increasing efficiency can save energy, money, and reduce GHG emissions.

EV (Electric Vehicle) - a vehicle which uses a battery and an electric motor instead of a traditional internal combustion engine.

GFL (Green For Life) - Waste and recycling service provider, previously known as Waste Industries.

GHG (Greenhouse Gas) - a gas that contributes to the greenhouse gas effect by absorbing infrared radiation.

GWP (Global Warming Potential) - a measure to compare the warming impacts of different gases relative to carbon dioxide.

HVAC (Heating, Ventilation, and Air Conditioning) - the systems used for moving air between indoor and outdoor areas, along with heating and cooling of the indoor area.

ICE (Internal Combustion Engine) - an engine powered by burning gasoline or other fuel.

IPCC (Intergovernmental Panel on Climate Change) – The IPCC is the United Nations body for assessing the science related to climate change.

kW (Kilowatt) - a measure of 1,000 watts of electrical power.

kWh (kilowatt hour) - a measure of electricity equal to 1 kW used for one hour.

LEED (Leadership in Energy and Environmental Design) – LEED is a green building system created by the United States Green Building Council. LEED provides a framework for highly efficient buildings.

MAFC (Morrisville Aquatics and Fitness Center) - newly renovated center provides the community with a year-round facility for swimming and fitness.

MESC (Morrisville Environment and Stormwater Committee) - MESC was formed to promote local recycling, stormwater, and other environmental programs. One of the goals is to educate residents and students in order to supplement efforts that serve to improve the Town's awareness on environment and sustainability efforts.

MMBtu (Million British Thermal Units) – MMBtu is a unit for measuring energy. It is commonly used to compare energy sources with differing units.

MSP (Master Sustainability Plan) – This plan defines the goals to be implemented primarily in Town operations, programs, and policies.

MSW (Municipal Solid Waste) - solid waste which is transported to the landfill.

MT (Metric Tons) - a unit of weight equal to 1,000 kilograms or 2,205 US pounds.

MT CO₂ₑ (Metric Tons of Carbon Dioxide equivalent) - the standard measurement for GHG emissions.

MW (Megawatt) - a unit of power equal to one million watts.

N₂O (Nitrous Oxide) - a potent greenhouse gas typically formed when fuel is burned at high temperatures.

Port – provides power to charge one electric vehicle at a time.

REC (Renewable Energy Certificate) – A REC is a tradeable, market-based instrument that represents the legal property rights to the "renewable-ness" defined as the non-power attributes of renewable electricity generation.

RFID (Radio Frequency IDentification) – a wireless system using radio waves to read information on a tag from a distance without contact.

RPCR (Recycling Participation and Contamination Reduction program) – RPCR is a program supported by the NC Department of Environmental Quality to expand and improve recycling participation by reducing waste.

STF (Sustainability Task Force) – The STF is an internal group representing each Town department to guide the development of the Master Sustainability Plan.

Therms - a unit of heat equivalent to 100,000 BTUs and the standard measurement for natural gas.

UDO (Unified Development Ordinance) – The UDO is An ordinance that guides and manages the development of Morrisville in a way that takes into account present and future needs and resources and that protects the health, safety, prosperity, and general welfare of the Town's citizens and landowners.

Contents

Executive Summary

Morrisville has experienced rapid growth over the last two decades. Town leadership determined that focusing on the sustainability of Morrisville would allow the Town to continue to grow and prosper. The Town has taken steps toward more sustainable practices and decided that a comprehensive sustainability strategy and the staff to develop and lead it were necessary.

The Town formalized the sustainability program as a comprehensive unit in 2020. As a foundation for the program, the development of a master sustainability plan (MSP) that focuses on Town operations, policies, and programs was initiated. This plan has five focus areas including, energy & water, transportation, waste & recycling, the built environment, and natural environment. A sixth focus area was added to quantify and reduce greenhouse gas emissions (GHG) as a result of the goals identified.

In November of 2020, the Town hired its first sustainability personnel with the creation of a Sustainability Coordinator position that reports to the Public Works Director. This position was tasked with developing the scope and commissioning the master sustainability plan draft. It is envisioned that a larger community-wide plan will be developed once the initial MSP plan is implemented.

Phase 1
- ❖ Assessment & Peer Analysis: This included an internal assessment of the Town's current sustainability landscape, and an external evaluation of the sustainability progress of four peer municipalities.

Prior to the formal establishment of the sustainability program, the Town had implemented sustainability projects that included building efficiency measures, a solar installation, and the integration of hybrid Police vehicles. The Town also has existing plans, studies, and ordinances that contain sustainability elements. These elements were identified and compiled to ensure the MSP aligns with and supports them.

The Peer Analysis included Cary, Apex, Chapel Hill, and Redmond, Washington. The first three are neighboring municipalities within the Triangle, who share similar demographics to Morrisville. Redmond has similar demographics, including location near a research and technology hub. All the peers, except for Apex, have long established community-centered sustainability goals and plans. Cary and Chapel Hill have significant EV charger infrastructure. All municipalities have robust recycling programs.

An analysis of Morrisville's energy and other utility usage for 2019 was completed and a baseline was established from this consumption data as shown below, along with the unit of measurement for the source. This baseline will be used to assess subsequent years' energy consumption and GHG emissions.

Electricity (kWh)	Natural Gas (Therms)	Gasoline (Gallons)	Diesel (Gallons)	Water (Gallons)
2,096,565	61,226	54,805	7,958	3,169,574

Phase 2

❖ Engagement Campaign: This campaign provided a forum for internal and external stakeholders and their priorities in terms of sustainability.

Community input was a primary focus in the development of the MSP. The goal was to gather a collective community-wide perception of sustainability and subsequent priorities for the plan. Engagement efforts included the development of an STF made up of representatives from every Town department, a community survey, focus groups, and pop-up events.

Focus groups included the community, industry, MESC, the STF, and Town Council. All these groups were consistent in identifying environmental protections as a priority for the Town. These groups were also supportive of the development of Town policies/ordinances that support the mitigation of climate change.

The survey asked respondents to rank sustainability priorities from a list. Environmental protection was ranked first, followed by emissions reduction second, and then renewable energy third. The top three responses to an open response question for ideas to make Morrisville more sustainable were renewable energy, followed by recycling, and then tree protection/planting. A more detailed summary appears on page 29.

The STF met monthly during the development of the MSP to review baseline data, participate in an interactive version of the survey, review the analysis of each of the focus areas, and provide insight as to the feasibility of proposed goals, strategies, and actions.

Phase 3

❖ Investigation and Analysis: The investigation included the creation of a Criteria Matrix to be used to vet sustainability efforts throughout the implementation of the plan. The analysis included a thorough review of all the information compiled in Phase 1 and 2 according to the five focus areas: energy & water, waste & recycling, transportation, natural environment, and the built environment.

The completion of Phases 1 and 2 in the development of the MSP provided an assessment for each focus area highlighting the following:

✓ 2019 Baseline
✓ Town sustainability projects completed/in-process
✓ Peer Analysis
✓ Survey
✓ Community Engagement
✓ Proposed Actions

A Criteria Matrix was developed to evaluate potential sustainability projects to determine which should be given priority for budgeting and implementation. The matrix contains five criteria, each with a scoring weight. Criteria includes feasibility, impact, cost, alignment with other plans, and stakeholder input.

Phase 4
  ❖ Goal Setting: Goals, strategies, and actions were developed for each of the five focus areas based on the findings in the analysis, including priorities determined as part of the engagement phase. A timeline for implementing the actions was developed after receiving feedback from the Sustainability Task Force (STF) and the Morrisville Environment and Stormwater Committee (MESC).

The goals and strategies for each of the five focus areas and greenhouse gas reduction are outlined in Appendix D, page 63. The goals, strategies, and actions developed in the MSP will allow the Town to demonstrate sustainability and enable the Town to provide sustainability leadership to the community beyond the scope of this plan.

Energy & Water

Electricity has a high GHG emissions factor and is the highest source of energy use for the Town. Therefore, reducing electricity consumption from non-renewable sources should be a key priority for the Town. This can be accomplished through improved efficiency and a transition to renewable sources. Natural gas is primarily consumed by the Morrisville Aquatics and Fitness Center. A strategy for addressing the emissions generated from the Center is to offset it by considering renewable energy or purchasing local Renewable Energy Certificates (RECs).

Transportation

Gasoline is the second highest emitter of GHG for the Town as well as the second highest energy source used. The development of a sustainable fleet policy will help reduce gasoline consumption through tools such as transitioning to hybrids and electric vehicles versus internal combustion engine (ICE) vehicles.

Waste & Recycling

The community recycling rate is above average and has risen significantly in the last three years. The introduction of the Recycling Participation and Contamination Reduction program (RPCR) is expected to provide a continued improvement in recycling rates.

Built Environment

Incorporating green standards into Town projects is a goal for improving the built environment. Building a sense of community includes walkability and bike-ability and aligns with multiple Town plans such as the Transportation Plan, as well as the Parks + Recreation Master Plan.

Natural Environment

The natural environment goals aim to protect the tree canopy and advocate for native plant use for Town projects. Support of the natural environment ensures we are protecting our natural assets like parks and greenways through thoughtful conservation.

Greenhouse Gas Emissions

The GHG reduction goal will be met through the achievement of both the electricity and gasoline reduction goals. Renewable energy certificates will be evaluated to offset any shortcoming in meeting the electricity and gasoline reduction goals. A greenhouse gas reduction goal is a natural result of the actions included in the focus areas.

Why Carbon Reduction Matters

The United Nations Intergovernmental Panel on Climate Change (IPCC) is an intergovernmental body of the United Nations mandated to provide objective scientific information relevant to understanding human-induced climate change, its natural, political, and economic impacts and risks, and possible response options. According to the IPCC, anthropogenic (human created) GHG emissions are trapping heat in the atmosphere, which is causing the planet to warm and the climate to change.[1]

The IPCC has created a pathway for reducing emissions which calls for a 45% reduction in GHG emissions globally by 2040, and net zero emissions by 2050.[2] Local governments across the world are committing to meeting similar goals for emissions reduction, including the peer municipalities analyzed for the MSP. The goals in the MSP will put Morrisville on a pathway toward reducing its Town-generated emissions and increasing the sustainability of the Town.

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[1] Intergovernmental Panel on Climate Change. *About the IPCC.* IPCC. 2021. https://www.ipcc.ch/about/
[2] Intergovernmental Panel on Climate Change. *Special Report Global Warming of 1.5ºC Summary for Policymakers.* IPCC. 2021. https://www.ipcc.ch/sr15/chapter/spm/

Introduction and Purpose

Morrisville, North Carolina is located adjacent to the Research Triangle Park – a national hotbed of technological development, hosting over 300 companies and 50,000 workers.[3] The Town's economy is based on highly skilled professional and technology industries, with a population that is diverse, affluent, and highly educated.

The Town was established in 1852 and began as a small, rural town centered around a railroad. It prospered over time with a hosiery mill as a major employer.[4] Morrisville had a population of just 5,000 until 2000 when the population began to grow quickly. Within a twenty-year span the population grew to almost 30,000. This significant growth was mostly due to its proximity to the Research Triangle Park, the Raleigh-Durham International Airport, and the continued growth of business and industry in the region.

Nothing says "All-America"[5] quite like the diversity of the Town of Morrisville. In June 2021, Morrisville was recognized as one of 10 All-America City award winners for the Town's work in inclusive civic engagement to build equity and resilience and create stronger connections among residents, businesses, and nonprofit and government leaders. Recognized by Money Magazine as the tenth best place to live in the U.S. in 2020,[6] and the Number 1 best place to live in North Carolina[7] by Niche.com during the same time span, Morrisville has become one of the fastest growing and most diverse municipalities in North Carolina. In 2019 the Chamber of Commerce (national website) ranked Morrisville the Number 2 Best City to Live in North Carolina[8] and WalletHub.com ranked Morrisville the Number 3 Best Place to Raise a Family in North Carolina.[9]

"Live Connected. Live Well" is the Town's brand tagline and philosophy.[10] When surveyed, residents communicated they value the connection they feel when in the Town. The connection they have to global businesses, opportunities, the great outdoors, and most importantly, to each other. Morrisville is a place to gather, to talk with neighbors,

[3] RTP, *Where People + Ideas Converge,* RTP, 2022, https://www.rtp.org/.

[4] Town of Morrisville, *History*, Town of Morrisville, 2021, https://www.townofmorrisville.org/government/departments-services/fire-rescue/history

[5] Town of Morrisville, *All America,* 2021, https://www.townofmorrisville.org/government/all-america-city

[6] Money, *Best Places to Live 2020,* Money, 2020, https://money.com/collection/best-places-to-live-2020/5699375/morrisville-north-carolina-2020/

[7] Niche, 2021, *Best Places to Live in North Carolina,* Niche.com, 2021, https://www.niche.com/places-to-live/search/best-places-to-live/s/north-carolina/

[8] Chamber of Commerce, *Best Cities to Live in North Carolina,* Chamber of Commerce*,* 2021, https://www.chamberofcommerce.org/best-cities-to-live-in-north-carolina/

[9] Wallet Hub, *Best Place to Raise a Family in North Carolina,* Wallet Hub, 2021, https://wallethub.com/edu/best-places-to-raise-a-family-in-north-carolina/27861

[10] Town of Morrisville, 2021, https://www.townofmorrisville.org/

and engage Town leaders. The community embraces small town ideals with all the conveniences and amenities of a metropolitan city.

Plan Scope

The MSP will serve as a guiding document for increasing the sustainability of Town operations and will act as a framework for the overall program. It is envisioned that a broader community-wide sustainability plan will be developed after the implementation of the MSP.

The MSP is an action plan framed around focus areas which represent key sustainability metrics and include associated goals, strategies, and actions. The focus areas are described below:

Energy & Water examines electricity, natural gas, and water usage for Town operations to identify opportunities to increase efficiency and shift to renewable options.

Waste & Recycling examines waste and recycling for Town operations to identify opportunities to decrease waste and increase recycling. Community recycling will also be examined for opportunities to increase the participation rate.

Transportation examines gasoline and diesel usage for Town operations to identify opportunities to decrease usage and shift to more sustainable fleet options.

Built Environment examines Town development such as buildings, parks, and greenways to identify opportunities to increase sustainability.

Natural Environment examines the Town's natural areas such as the tree canopy to identify opportunities to protect and increase these areas.

Plan Development Process

The MSP was developed through a four-phase process as follows:

Phase 1 - An intensive internal assessment was conducted of the current state of the Town of Morrisville in terms of sustainability. It also included an external component to create a comparison of peer efforts within sustainability.

The internal assessment included an inventory of completed and in-progress sustainability projects. A review of key guidance documents such as the Strategic Plan was conducted to identify sustainability focus in those plans. The goal with this identification is to note alignment opportunities among the plans and studies.

Externally, a Peer Analysis of adjacent municipalities, along with one outside the state was completed. The Peer Analysis collected information on each town in terms of Population, Energy, Carbon Mitigation, Transportation, Green Building, Waste/Recycling, and Conservancy.

Phase 2 - An Engagement campaign was held to receive stakeholder input on various sustainability topics. Over a six-month period, input was collected from Town staff, residents, business owners, non-profit leaders, and community groups which provided insight into both the priorities of the community and actions favored.

Phase 3 - All the information gathered during Phase 1 and 2 was analyzed and findings were documented. A Criteria Matrix was developed to vet future sustainability projects. The Matrix uses five criteria established as key decision-making values to score potential sustainability projects.

Phase 4 - Goals, strategies, and actions were drafted for each of the five sustainability focus areas based on the information gathered in previous phases. These goals, strategies, and actions were presented to both internal and external stakeholders, including the community, MESC, the STF, Town department heads, and Town administration for review and input. Feedback from these meetings was incorporated and included in this plan.

MSP Development Process Overview

Phase 1 – Assessment & Peer Analysis

- ✓ Inventory of Town sustainability projects
- ✓ Sustainability integration with Town Plans and Studies
    - Affordable Housing Study
    - Comprehensive Transportation Plan
    - Land Use Plan
    - Smart Morrisville Strategy
    - Strategic Plan
    - Parks + Recreation Master Plan
    - Unified Development Ordinance
- ✓ Peer Sustainability Assessment

Phase 1a – Energy Consumption Baseline

Phase 1b – Greenhouse Gas Inventory

Phase 2 – Engagement Campaign

- ✓ Sustainability Survey
- ✓ Focus Groups
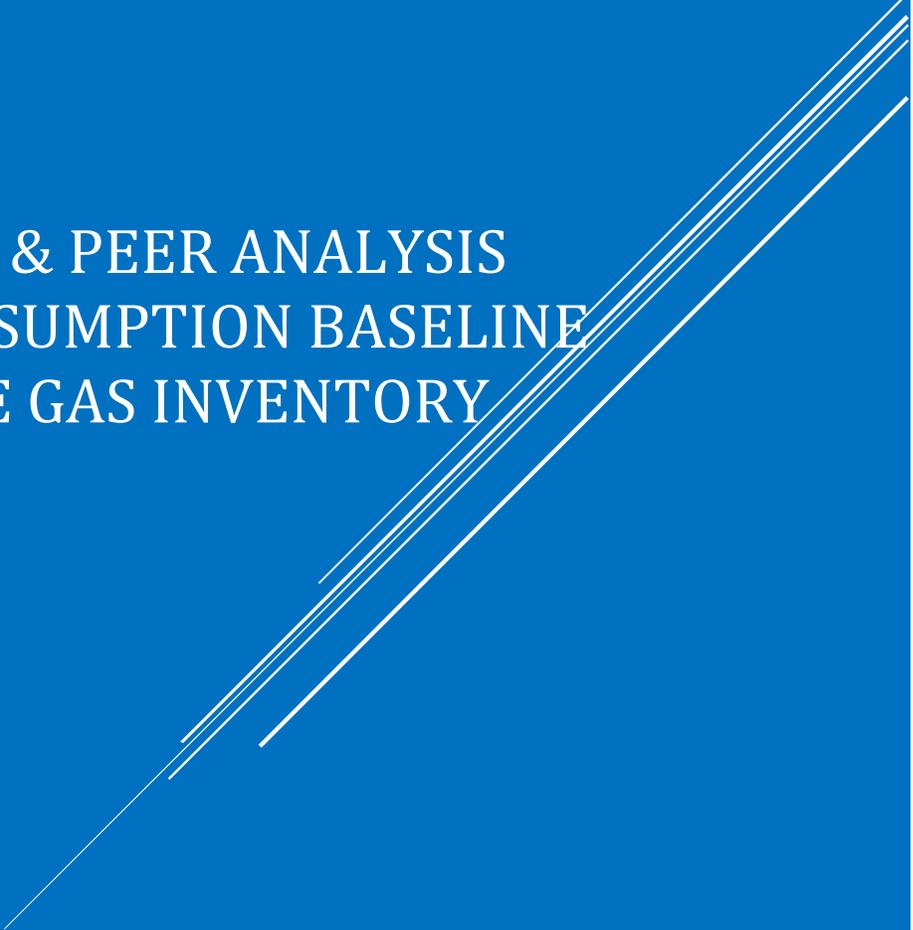- ✓ Sustainability Task Force
- ✓ Tabling Events

Phase 3 – Investigation & Analysis

- ✓ Criteria Matrix
- ✓ Analysis of Assessment and Engagement Campaign Results

Phase 4 – Goal Setting

- ✓ Energy/Water
- ✓ Waste & Recycling
- ✓ Transportation
- ✓ Built Environment
- ✓ Natural Environment

PHASE 1
ASSESSMENT & PEER ANALYSIS
ENERGY CONSUMPTION BASELINE
GREENHOUSE GAS INVENTORY

Assessment and Peer Analysis

The MSP development process included both an internal assessment of the Town to have a clear picture of sustainability progress, and an external assessment of peer municipalities to identify the sustainability goals and progress of neighboring municipalities.

Internally, an inventory of completed sustainability projects was conducted and categorized by focus area. A 2019 baseline was developed for energy and water for Town operations, as well as GHG emissions. The energy sources included electricity, natural gas, gasoline, and diesel. A baseline for water consumption for Town operations was also created. Waste and recycling data to complete a baseline of usage was not available for Town operations. A plan for addressing the waste and recycling baseline is contained in this plan. Community waste and recycling baselines have been included.

Additionally, Town plans such as the Strategic Plan, Smart Morrisville Strategy, Comprehensive Transportation Plan, Land Use Plan, Parks + Recreation Master Plan, and the Affordable Housing Study were reviewed to identify sustainability focus in the plans. A snapshot of the sustainability synergy for all the plans was captured and is shown in Table 10, beginning on page 42.

Externally, a Peer Analysis was completed to provide a snapshot of the sustainability progress of adjacent municipalities such as Cary, Apex, and Chapel Hill. The analysis also includes Redmond, Washington as a peer since it is a close match to the demographics of Morrisville. The analysis included energy goals, SolSmart designation, proclaimed climate protection agreements (if any), GHG baseline, emissions goals, green buildings, waste and recycling services, Monarch Pledge, Bee City, and Tree City USA designations.

Assessment of Completed Town Sustainability Projects

An internal assessment of sustainability focused projects completed by the Town was conducted and inventoried according to the sustainability focus areas: Energy & Water, Waste & Recycling, Transportation, Built Environment, and Natural Environment. This information revealed opportunities for improvements.

Energy & Water

The Town has completed several important projects to improve the efficiency of Town buildings/equipment and offset non-renewable electricity consumption with solar as shown in Table 1.

Table 1: Assessment of Completed Energy & Water Town Projects

PROJECT	IMPACT
30 kW Solar Array	Offset Fire Station electricity
Identified no-cost Duke Energy programs	Technical expertise provided for Town building efficiency improvements
Replaced old HVAC systems with new energy efficient systems	Public Safety 2%, Town Hall 7%, MCP facility 12% for a total of 21% electricity reduction since 2018 due to systems upgrades
Backup power for Town Hall & Police Department	Resiliency
Power saver mode on computers and printers	Efficiency measure
EV Charging Stations (4 ports)	Broadening EV adoption
Building Automation System pilot Public Safety Bldg.	Pilot test through 2022 to determine further adoption, BAS Master Plan completed 4/2022.
Fire Station #3 solar BAS, EV chargers, waste diversion	In Process. Completed project will have lower GHG due to design phase efficiency measures.

Fire Station 1 has a 30-kW solar array which offsets approximately 40% of the electricity for the station. Sustainability initiatives such as rooftop solar, a building automation system, and electric vehicle charging station infrastructure have been considered in the design for Fire Station #3. Additionally, during the construction process, waste diversion strategies will be implemented to reduce the amount of waste going to the landfill.

The Town's first solar array on Fire station #1.

The replacement of old heating, ventilation, and air conditioning (HVAC) systems in three Town buildings resulted in a combined reduction of 21% since 2018. The buildings will continue to operate at this lower level of electricity use provided the systems are maintained.

A building automation system (BAS) pilot at the Public Safety building has been implemented and is being monitored for savings and efficiency. A BAS monitors and controls a building's systems, which will increase the efficiency of the systems and reduce energy usage and costs.

Additional efficiency measures include the use of power saver mode on computers and printers throughout Town offices and buildings.

Waste & Recycling

The Waste & Recycling assessment of Town operations revealed that some progress has been made with waste and recycling as shown in Table 2. Most departments are actively recycling paper and batteries.

Table 2: Assessment of Current and Completed Waste & Recycling Projects

PROJECT	IMPACT
Recycling Participation & Contamination Reduction program	New program. Impact will be measured through change in recycling participation through 6/30/2022.
Recycle batteries	Reduce hazardous waste going to landfill
Recycle paper (multiple departments)	Reduction in paper to landfill

While the MSP is primarily focused on improving sustainability within the Town's operations, it includes community recycling in the plan. The Town launched its Recycling Participation & Contamination Reduction (RPCR) program in 2021. The RPCR provides residents with a magnet with clear information about proper recycling, including what can and cannot be recycled. The assessment of community recycling rates indicated the community is recycling at a higher-than-average rate. However, there is still room to improve. The RPCR is expected to have a positive impact on recycling rates. Monthly rates will be evaluated, and outreach efforts will be ongoing.

Several opportunities to increase recycling and decrease waste within Town operations were identified during the assessment including:

- Physical recycling infrastructure changes for consistency
- Evaluation of recycling disposal process
- Reduction in single-use packaging
- Printing policy
- Use of sustainable products for events (sustainable procurement)

Transportation

Morrisville has made substantial progress with transportation efforts as shown in Table 3. Telematics has been installed on Town vehicles. Telematics monitors the vehicles to improve efficiency and provide data on its use. The Town has also incorporated 9 Ford Hybrid Police Interceptors into the Police fleet.

The hybrid provides increased fuel efficiency and uses the battery when the vehicle is idling. According to the manufacturer, the hybrid saves approximately 1,300 gallons and 22,560 pounds of carbon per year compared to its internal combustion engine equivalent.[11]

The Town has a hybrid purchase practice, so as vehicles are replaced in the fleet, future reductions will continue. The department historically has discouraged idling to reduce gasoline consumption. The Police Department is also using electric bikes during special events.

Table 3: Assessment of Completed Transportation Town Projects

PROJECT	IMPACT
Telematics (monitors vehicles to improve efficiency)	Monitors mpg, fluid levels, tire pressure, etc.
Fuel efficient vehicles for staff	9 hybrid Interceptors (PD) 3.54 MT net reduction per hybrid
Hybrid purchase practice	Police Department 3.54 MT net reduction per conversion
Electric bikes	Zero emissions
Idling discouraged	Reduction in gasoline consumption

The Town has made a significant push for public transit with the addition of the Morrisville Smart Shuttle, provided by GoCary, transit provider for the Town of Cary. This service provides residents, commuters, and visitors free, on-demand transit throughout the Town. The service connects residents with 14 locations in Morrisville, called nodes. An additional node is located at the Regional Transit Center which allows for further connection within the RTP and surrounding areas. A rider can schedule their pick-up and drop-off from their computer or smartphone. There is no cost to use this shuttle service. Shuttles run seven days a week. Select stops connects to GoCary, GoApex, GoRaleigh, GoDurham, and Chapel Hill Transits.

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[11] Ford Motor Company, *The Ford Interceptor Police Utility,* Ford Police Vehicles, 2021, https://www.ford.com/police-vehicles/hybrid-utility/

Sustainability Alignment with Existing Town Plans

The following summary includes references to various elements foundational to fostering sustainability within the Town of Morrisville. The intent of each of the plans is summarized including their reference to the environment or sustainability respectively. For additional information on the alignment of existing plans with the MSP reference Table 10, page 42.

Affordable Housing Study

In 2019, Morrisville commissioned an Affordable Housing Study which sought to better understand the affordable housing challenges facing the region, and community, and to provide options for responding to those challenges with a course of action that was both effective and practical. The study included the following recommendations for action:

1. Establish a Community Servant Housing Choice Program
2. Create an Affordability Partnerships Toolkit
3. Pay into a Regional Housing Trust Fund

The Town has selected a consultant to provide an implementation plan for items 1 and 2 in the list above.

Comprehensive Transportation Plan

Updated in 2019, the Town's Comprehensive Transportation Plan created a blueprint for a safe, multimodal, and interconnected transportation system. The plan considered existing and future needs and priorities for all travel modes. One of the document's guiding statements within 'Culture and Environment' included: Enhance the Town's quality of life by preserving and promoting its valued places and natural assets to:

- protect and enhance the natural and social environment by using context sensitive transportation strategies.
- minimize direct and indirect environmental impacts of the transportation system.

The plan states a commitment to promote more active travel infrastructure for the benefit of the environment, resident quality of life, and social justice.

Land Use Plan

The Town adopted an updated Land Use plan in 2021 to better directionalize the increasing growth that the Town and region are experiencing. The most noticeable statement referencing sustainability is the 'Environmental Stewardship Goal.' The plan includes many references to Smart Growth and design features that encourage greenspace and walkable streets, minimizes large surface level parking, and highlights the importance of recognizing the value of a tree canopy as an asset.

Parks + Recreation Master Plan

The 2018 Parks + Recreation Master Plan provides a framework for future growth and improvements across the park system, supporting decisions regarding parkland and facilities, programs, operations, and finances. The recommendations are data-driven and

developed through an analytical and 'level of service' approach. It included prioritized recommendations to improve the recreational offerings for a ten-year planning horizon. Several objectives under goal 1 included sustainable topics such as increasing the connectedness of parks, trails, and open space, as well as sourcing materials locally, and supporting green infrastructure through renewable energy.

Smart Morrisville

Smart Morrisville establishes opportunities to harness automated real-time data collection and use it to optimize service delivery, while holding true to connecting its diverse community to an enhanced quality of life through innovative programs and services. The plan identified a top 5 list of initiatives:

1. **Master Sustainability Plan**
2. Intelligent Transportation Initiatives
3. Connected Park Initiative
4. Further Morrisville's Open Data Project
5. Deploy Morrisville Connect App

The Smart Morrisville Strategy provides a roadmap for implementing the innovative technologies that can be leveraged to meet the expectations of the digitally savvy residents and business community that make up Morrisville.

Connect Morrisville Strategic Plan Goals

GOAL 1: Improved transportation mobility

Enhance transportation options through improved accessibility, connectivity, and collaboration.

GOAL 2: Thriving, livable neighborhoods

Enrich the quality of life through the preservation of natural resources, well-planned development and strengthened neighborhood vitality.

GOAL 3: Engaged, inclusive community

Enrich the quality of life through programs, events, amenities, and services valued by the community.

GOAL 4: Public safety readiness

Provide a safe and secure community through prevention, education, readiness, and response.

GOAL 5: Operational excellence

Deliver exceptional service with an engaged workforce that effectively manages public assets and promotes transparency.

GOAL 6: Economic Prosperity

Promote a business-friendly environment to diversify the economic base and attract an educated and highly skilled workforce.

Connect Morrisville Strategic Plan

The Connect Morrisville Strategic Plan was originally adopted in April 2018. Since 2018, the Town has experienced exponential growth. In July of 2021, the Town Council unanimously approved the updated plan for 2021-24. The Plan's mission, vision, four core values, and six goals remain in place. The updated plan now includes 17 objectives, 17 initiatives, and 20 outcome measures.

Peer Analysis

The Peer Analysis provides a snapshot of sustainability initiatives with Morrisville's peers including Apex, Cary, and Chapel Hill as

shown in Table 4, page 18. These three municipalities were chosen based on proximity to Morrisville and similar trends in population growth.

Redmond, Washington was also included as a peer town due to its similar population growth (highest in the state),[12] resident demographics, and location in relation to high tech employers such as Microsoft Corp. and Nintendo.

The sustainability initiatives analyzed include published goals surrounding reductions in energy, carbon mitigation, transportation, green building, waste/recycling, and conservancy.

According to the 2020 U.S. Census, Morrisville's current population is 29,630[13] and boasts significant diversity with a 46% Asian population. The Raleigh/Cary metropolitan statistical area (MSA) experienced a 99.8% increase in Asian population from 2010-2020, according to a William H. Frey analysis.

Map courtesy of IndyWeek.

Morrisville also experienced exponential growth with an approximate 60% increase between 2010 and 2020. Apex also experienced tremendous growth with a 57% increase in the same period. Redmond, the fastest growing city in Washington, saw a 32% increase and has a 36% Asian population.[14]

Town attributes such as population, diversity, growth, and industry provide insights into the viability of community needs and preferences when considering present and future initiatives surrounding sustainability. These have been accounted for within the goals, strategies and actions that have been identified in this report.

Peer Analysis Key Take-Aways by Focus Area

Energy

The peers assessed have established sustainability programs that have moved beyond operational goals and objectives. Cary had a goal to reduce energy use by 13% by 2020 for its operations. Apex is currently pursuing 80% renewable energy by 2030 and 100% by 2050 for town operations.

Chapel Hill is pursuing 80% renewable energy by 2030, and 100% by 2050 for community emissions. Both Apex and Chapel Hill have attained gold designation within the SolSmart program with Morrisville earning gold in January 2022. The SolSmart designation

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[12] United States Census Bureau, *America: A Nation of Small Towns*. 1/5/22:
https://www.census.gov/library/stories/2020/05/america-a-nation-of-small-towns.html
[13] United States Census Bureau, *Quick Facts,* U.S. Census, 2020,
https://www.census.gov/quickfacts/fact/table/morrisvilletownnorthcarolina/BPS030220
[14] Ibid.

identifies designees as solar-friendly after assessing it for potential barriers or obstacles to solar implementation.

Transportation

Morrisville and Apex have limited town-owned electric vehicle infrastructure. Chapel Hill and Cary are both further along with 17 and 27 charging ports respectively. Morrisville has four charging ports. A 'port' provides the power to charge one electric vehicle at a time. A charging station can have more than one port. Three of the 4 peers have a designation from The League of American Bicyclists as Bicycle Friendly America[sm] designees, which is a movement to create a Bicycle Friendly America for everyone.

Green Buildings & Recycling Waste

Chapel Hill adopted a Green Building Ordinance for municipal facilities in 2017, which stipulates that new or expanded facilities will meet the American Institute of Architects 2030 challenge for fossil fuel reduction targets and LEED rating systems. All peers offer recycling and yard waste collection services. Cary and Apex also provide composting education, and Chapel Hill has a pilot composting program within select town facilities. Chapel Hill also tracks their waste diversion rate / recycling rate. Cary offers the most robust recycling program which includes electronics, appliances, and used oil.

Conservancy

Peer municipalities have committed to conservation initiatives such as the Mayor's Monarch Pledge and Tree City USA. Apex has committed to both environmental designations, as well as a Bee City designation. Morrisville is currently part of the Mayor's Monarch Pledge.

Carbon Mitigation

Three of the 4 peer municipalities have both emissions baseline data as well as emissions reduction goals. The baseline emissions are community-wide; not limited to town operations. Chapel Hill committed in 2006 to reduce its carbon emissions 100% by 2050 and has developed a community-wide action plan to achieve its goal. Cary has a goal of 25% reduction by 2025 and 100% by 2040. In 2019 Cary's Town Council accepted Carbon Reduction Recommendations created by its Environmental Advisory Board. As part of the recommendation, Cary plans to update its strategic energy plan to meet the reduction goals set. Redmond developed a community-wide Sustainability Action Plan in 2020 to meet its emissions reduction goal of 100% by 2050. As of early 2022, Apex was in the process of completing its first greenhouse gas inventory. Apex has a goal to reduce emissions from operations by 80% by 2035 and 100% by 2050.

Additionally, 3 of the four peers are part of the Mayors Climate Protection Agreement through The United States Conference of Mayors. This agreement vows to reduce carbon emissions in represented cities below 1990 levels, in line with the Kyoto Protocol.

Table 4: Peer Analysis

	Community	Morrisville	Cary	Apex	Chapel Hill	Redmond, WA
Population Growth (Ranking)*	Population	29,630	170,282	59,300	64,051	71,929
	% of Growth 2010-2019	55.2% (29)*	25.4% (152)*	57.2% (22)*	11.9% (417)*	32% (99)*
Energy	Renewable Energy Goal	--	13% overall energy reduction by 2020 for Town operations	Town operations 80% clean energy by 2035 100% by 2050	80% renewable energy by 2030 100% by 2050	100% by 2050
	SolSmart	Gold	Silver	Gold	Gold	None
Carbon Mitigation	Mayors Climate Protection Agreement	No	Yes	No	Yes	Yes
	Emissions Baseline	2019: 1,624 Metric Tons	2018: 1,714,500 MT	--	2005: 1,047,516 MT 2017: 914,825 MT	2011: 800,000 MT
	Emissions Goal	--	Reduce Emissions by 25% (2025) and 100% (2040)	--	Reduce emissions by 100% by 2050	Reduce emissions by 100% by 2050
Transportation	Number of EV Charging Ports	4	27	6	17	31
	Bicycle Friendly America[sm]	None	Bronze	None	Silver	Silver
Green Building & Waste/Recycling	LEED Certified Cities and Communities	No	No	No	No	No
	Other GreenBuilding Certifications for Municipal Structures	None	None	None	LEED Rating System Compliance Architecture 2030 Challenge	None
	Waste and Recycling	Offers recycling and yard waste collection services and recycling / collection events	Recycles yard waste, electronics, appliances , used oil (used for biodiesel) Provides composting educational opportunities	Recycling includes electronics and appliances Provides composting educational opportunities	Waste diversion rate reached 64% in 2014 through recycling Composting Pilot Program within select Town Facilities	Waste diversion 45% - 2017 Commercial organics composting program
Conservancy	Mayors' Monarch Pledge	Active	Past-Pledge	Active	Active	No
	Bee City	No	No	Yes	No	No
	Tree City USA	No	Yes (37 years)	Yes (4 years)	Yes (21 years)	Yes

* The ranking by the Census Bureau of the fastest growing cities can be found in parentheses in the population growth section of this table and as referenced in footnote 12.

Baseline for Sustainability Focus Areas

Energy (electricity and natural gas), water, solid waste and recycling, and transportation (gas and diesel) data were compiled for 2019 actual consumption to establish a baseline year from which to benchmark future consumption. The process for developing and using these baselines is shown in the graphic below. The utility companies provided 2019 consumption data. It was then organized into Excel and baselines were then developed. Graphic depictions of the baselines were then created. The findings were then used when developing the goals for this plan.
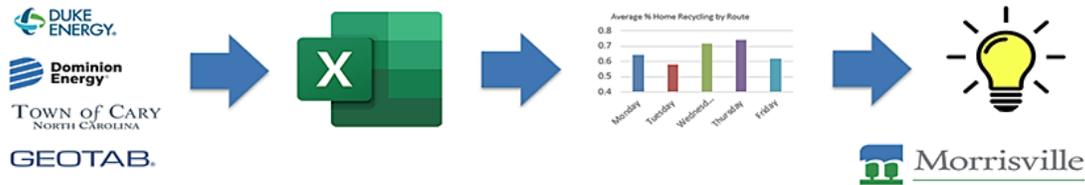
The actual usage of electricity, natural gas, gasoline, and diesel for 2019 is found in Appendix A. In selecting a baseline year, it is important to remove outliers such as the Covid 19 pandemic which rendered years 2020-2021 as not representational of 'business as usual' energy consumption. This 2019 usage data was used to create the baseline for each energy source. The baseline will be used as a benchmark for utility consumption in future years. Monitoring future consumption against the baseline provides a means to track and address anomalies in usage and identify opportunities for improvement. The benchmark will be used to determine the progress of energy reduction goals set in the MSP.

Total consumption for each of the utilities is broken down by department to better understand how the utility is used. Several departments use the bulk of the energy, such as Parks and Recreation, Public Works, Police and Fire departments. Other departments such as Engineering, Planning & Inspections, and Communications have low consumption patterns. To simplify the management of the utilities for the MSP, Finance, Communications, Human Resources, IT, Planning & Inspections, Engineering, and Town Administration are all listed as 'Administration' in the breakdown of utility costs.

The breakdown of usage by department provided the details needed to better understand how the Town is using energy. These details revealed opportunities for reduction and the level of impact which potential projects could have on energy and emissions reduction.

Electricity
Electricity consumption for the Town was 2,096,565 kWh in 2019.   Electricity consumption for 2019 by department is shown in Figure 1. Parks and Recreation is the largest consumer of overall electricity, with several buildings including the MAFC. The Parks and Recreation department's electricity usage also includes the park and ballfield lights under its management. Public Works has the second highest usage. Total usage for

this department includes streetlighting, which alone accounts for 18% of total emissions. Administration has the third highest usage and includes several buildings. Police has the fourth highest usage, followed last by Fire.
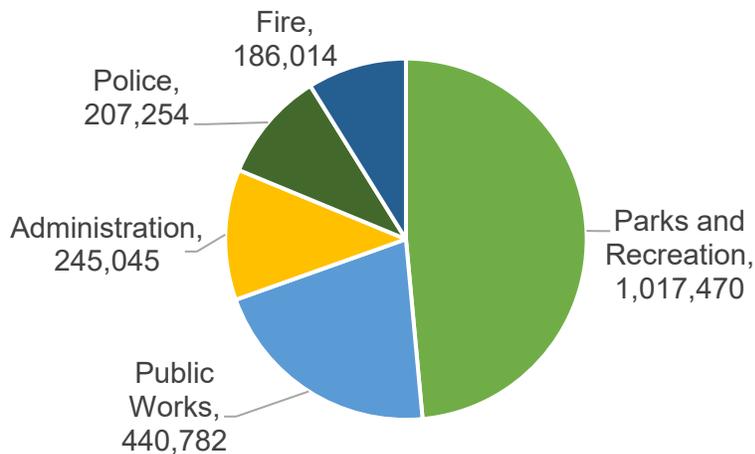

Figure 1: Total kWh electricity by department

Natural Gas

Natural gas consumption for the Town was 61,226 Therms in 2019. Natural gas consumption by department is shown in Figure 2. Parks and Recreation is the largest user of natural gas, particularly given the use of natural gas at MAFC,[15] which accounts for 84% of the usage for the Town. The remainder of the usage comes from heating at Fire Stations and for powering back-up generators.
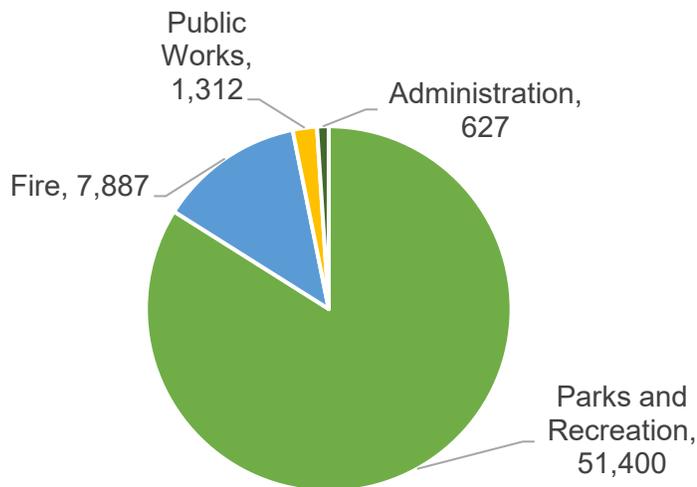

Figure 2: Total natural gas Therms by department

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[15] MAFC underwent significant renovation in 2019. In order to include this high-energy consuming building in the 2019 baseline, 2021 actual utility usage was used in proxy.

Gasoline

Gasoline usage for the Town was 54,805 gallons in 2019. Gasoline consumption by department is shown in Figure 3. The Police Department is the highest user of gasoline. The Police Department utilizes patrol cars as part of daily operations and are also take-home vehicles. Public Works is the second highest user, with the daily use of trucks and other equipment. The other departments listed have much lower gasoline usage.
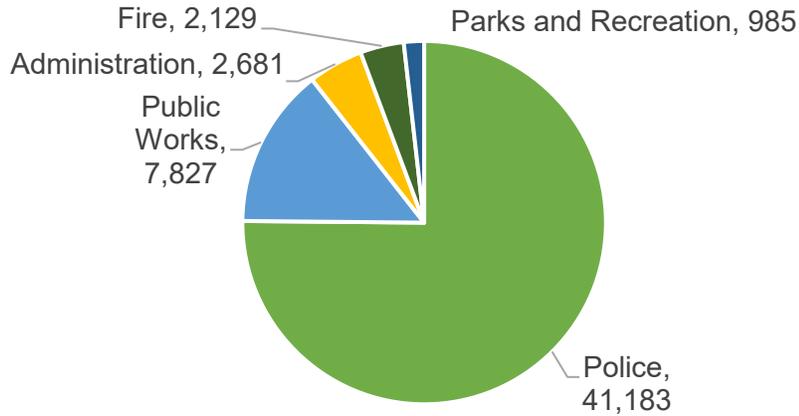
Figure 3: Total gasoline gallons by department

Diesel

Diesel usage for the Town was 7,958 gallons in 2019. Diesel consumption by department is shown in Figure 4. The Fire Department is the highest user of diesel since firetrucks use this fuel. Public Works has other equipment such as generators that use diesel fuel.
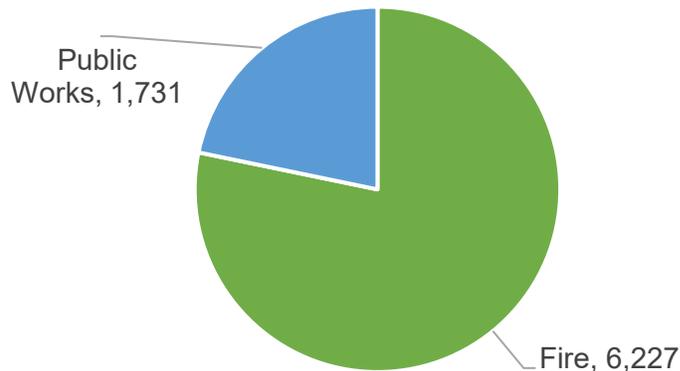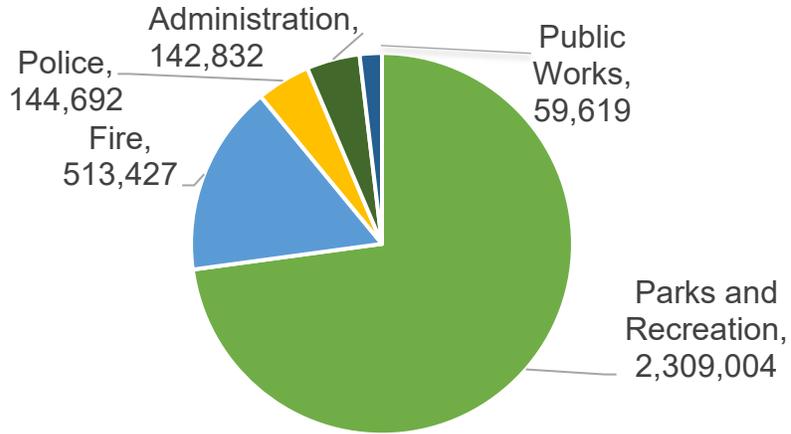
Figure 4: Total diesel gallons by department

21

Water

Water usage for the Town was 3,169,574 gallons in 2019. Parks and Recreation uses almost three-fourths of the water as shown in Figure 5. Fire is the second highest user, followed by Police, Administration, and Public Works.

Figure 5: Gallons of water per department

Waste & Recycling

An assessment of this focus area includes both solid waste and recycling for Town operations as well as data on 2019 community recycling rates provided by GFL, the waste management provider.

Town Operations

The development of the Town's operations assessment found that quantities of waste and recycling are not measured and recorded by the provider. The data available for Town operations can be found in Appendix B, and includes the location, size, type, and cost for the dumpsters serviced by GFL. This data does not provide the Town with a way to establish a solid baseline for waste and recycling usage, or to measure changes in usage. However, there may be an opportunity to reduce dumpster size and/or the frequency of pick-up, which will reduce costs, and can serve as an indicator of waste reduction and an increase in recycling.

Community Recycling

Community recycling has risen 13% since 2019 as shown in Figure 6. This is especially impressive since the EPA states the national recycling rate is 32%.[16]

Figure 6: 2019 - 2021 Recycling Participation Rates

The 2019 participation rate and total tonnage as shown in Figure 6 will be used as key performance indicators to assess progress in improving community recycling. GFL provides waste and recycling curbside container pick-up to the residents of Morrisville. It uses a radio-frequency identification device (RFID) to identify and track each container it services and provide GFL with weekly data on each container. The Town service boundary is made up of five routes that consistently run the same day each week. Monthly data on recycling tonnage and participation rate is available for each route.

Table 5: 2019 Community Recycling Data

2019 Community Recycling Data (annually)	
Recycling	1,410 tons
Recycling per home	175 pounds

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[16] EPA. *National Recycling Strategy.* Environmental Protection Agency. 2022. https://www.epa.gov/recyclingstrategy.

Greenhouse Gas Inventory

The 2019 energy consumption baseline was used to establish a greenhouse gas inventory which included both Scope 1 and Scope 2 emissions generated from Town operations. Scope 1 represents emissions which the Town has direct control such as fleet vehicles. Scope 2 emissions represents purchased electricity for which the Town has indirect control. Scope 3 emissions are under indirect control of the Town and are not included in this inventory. Scope 3 examples include employee commuting and purchased goods and services.

The development of the Town's 2019 inventory utilized the *Global Protocol for Community-Scale Greenhouse Gas Emissions Inventories* tool developed by the World Resources Institute, C40 Cities, and ICLEI – Local Governments for Sustainability.

Emissions Factor

Energy use is multiplied by an emissions factor to calculate the emissions. The emissions factor is a multiplier that equates to the amount of greenhouse gas created from the consumption of a specific unit of the energy source. Emissions factors are specific to both energy source and specific greenhouse gases. They can change for energy sources, specifically electricity. Electricity is generated from a mixture of sources such as coal and natural gas generation, hydroelectric, nuclear, solar, wind, and other renewable sources. Generation mix changes will impact the emissions factor.

Global Warming Potential

Carbon dioxide equivalent (CO_2e) is calculated by using the GWP for each of the GHGs as shown in Table 6. GWP is the ratio of radiative forcing (degree of warming in the atmosphere) that would result from the emission of one unit of a given GHG compared to one unit of carbon dioxide over a one-hundred-year time horizon.[17] This means that 1 unit of methane is equivalent to 28 units of carbon dioxide, and Nitrous Oxide is equivalent to 265 units of carbon dioxide over a one-hundred-year time horizon.

Table 6: Global Warming Potential Ratios

Common Name	Formula	GWP
Carbon Dioxide	CO_2	1
Methane	CH_4	28
Nitrous Oxide	N_2O	265

Emissions Unit of Measurement

Greenhouse gas emissions are measured in metric tons of carbon dioxide equivalent, expressed as MT CO_2e. The use of this unit allows all the GHGs measured to be expressed as a common unit. Emissions are calculated by multiplying the unit of energy by the

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[17] IPCC, *Special Report Global Warming of 1.5º C Summary for Policymakers, 2018.* <u>https://www.ipcc.ch/sr15/</u>

emissions factor, and then multiplying by the GWP. The total will be expressed as MT CO_{2e}.

Greenhouse Gas Emissions by Energy Source

Emissions were calculated for Town operations using the 2019 baseline data for electricity, natural gas, gasoline, and diesel. Table 7 shows the breakdown of emissions in MT CO_{2e} by each energy source. Electricity accounts for 711 MT CO_{2e}, or 44% of the Town's emissions. Buildings and streetlights account for most of the electricity usage. Gasoline accounts for the second highest emissions at 489 MT CO_{2e}. Fuel for Police vehicles accounts for a large percent of gasoline usage. Natural gas accounts for 343 MT CO_{2e}, or 21% of emissions. Diesel is only 5% of the emissions footprint, or 81 MT CO_{2e}.

Table 7: Town GHG Emissions by Source

Emissions Source	MT CO2e (% of Total)
Electricity	711 (44%)
Natural Gas	343 (21%)
Gasoline	489 (30%)
Diesel	81 (5%)
Total	**1,624 (100%)**

Emissions Comparison

A comparison of emissions per capita was developed with data available from peer sustainability and energy plans as shown in Table 8. Both Cary and Chapel Hill provide public transportation, water, and wastewater services, which Morrisville outsources. Emissions from those services were omitted to obtain a more accurate comparison. Both Chapel Hill and Cary are larger in population and geographic size. Chapel Hill is more than double in both, and Cary is almost five times the population, and over seven times the size. To adjust for these differences, emissions were normalized by population. Emissions per capita for the three peer municipalities is almost the same at 0.05% and 0.06%.

Table 8: Emissions Comparison with Peer Municipalities

	Morrisville	Chapel Hill	Cary
Population	29,630	64,051	147,561
Size (square miles)	8	22	60
Building Emissions	876	2,624	7,565
Streetlight Emissions	178	897	1,102
Total Building/SL	1,054	3,521	8,667
Fleet Emissions	570	6,498	9,861
Total Emissions	1,624	10,019	18,528
Emissions per Capita	**0.05**	**0.05**	**0.06**

PHASE 2
ENGAGEMENT CAMPAIGN

Engagement Campaign

The goal of the engagement campaign was to glean a holistic, comprehensive picture of the collective community-wide perception of sustainability and the priorities for the program. Engagement efforts included the development of a Sustainability Task Force (STF), an on-line survey, community meetings, pop-up events, and an interactive presentation with Town Council.

Sustainability Task Force

The assembly of a STF representing Town departments was integral to ensuring institutional knowledge informed key decisions within the plan. Each department was asked to designate a team member to participate in the development of the MSP to help inform and assess the process, as well as to provide a department-specific perspective. All departments were represented on this Task Force, which met monthly from July to January. Key milestones for this group included defining sustainability, creating a vision statement, finalizing the Criteria Matrix, and then validating it to assess the action items as recommended in this report.

Sustainability: What does it mean?

To level set a definition of sustainability, the STF members each presented three words that represented what sustainability meant to them. Key words included efficiency, environment, reduction, and resources.

Sustainability Survey

An online survey was created to solicit input from all Morrisville stakeholder groups including residents, business owners/employees, staff, government officials, non-profit organization supporters, and other interested community members.

STF Vision Statement

As members of the Sustainability Task Force, we identify the term "sustainability" as a commitment to achieving equitable sustainable development that establishes initiatives to reduce waste and consumption while promoting the preservation of our resources and features, including physical structures.

To accomplish this, and protect both human and environmental health, we stress the necessity for the reliance on scientific data when considering initiatives and a commitment to continuous education and communication amongst all Town stakeholders.

Survey Distribution

✔ Morrisville Connections newsletter

✔ Kiosks
- o Morrisville Aquatics & Fitness Center
- o Cedar Fork Community Center
- o Morrisville Community Library

✔ Video promotion
- o Social media networks
- o DOC NC Youth Leadership Group events

✔ Survey shared and promoted by local partners
- o Morrisville Chamber of Commerce
- o Duke Energy
- o Wake Technical Community College
- o RTP (as part of the Research Triangle Foundation)
- o the IBM Green Team

Morrisville Community Library display with iPad access

Sustainability Survey

1. Please share your affiliation with the Town of Morrisville.
   - ☐ Resident
   - ☐ Business Owner/Employee
   - ☐ Student
   - ☐ Non-Profit
   - ☐ Town Staff
   - ☐ Government Official

2. Traditionally, sustainability thrives from a balance of environmental, social, and economic factors. Please rank your priorities as they relate to sustainability for the Town:
   - ☐ Emissions reduction
   - ☐ Environmental protections
   - ☐ Renewable energy adoption
   - ☐ Alternative transportation options (biking, walking, public transit)
   - ☐ Food waste/recycling

3. What kinds of things do you do to be more sustainable in your home/work/community?
   - ☐ Recycle
   - ☐ Conserve water
   - ☐ Plant native trees
   - ☐ Replace old equipment or appliances with EE models
   - ☐ Incorporate renewable energy
   - ☐ Use alternative transportation whenever possible

4. What ideas do you have for a more sustainable Morrisville?

Survey Results

The Sustainability Survey was available from August 27th through October 31st, 2021. A total of 307 responses were collected. Of the 307 responders, 190 provided their contact information to remain engaged in the sustainability program. This will allow the program to build a network of advocates in support of the Town's efforts. The survey respondents were 75% residents, 18% Town staff, 7% business owners, nonprofits, and students.

A key question asked in the survey was for respondents to rate their top three priorities as they relate to sustainability of the Town. Figure 7 shows the respondent's top three priorities with the top priority in dark blue, second highest priority in medium blue, and third highest priority in light blue. Environmental Protection is important to the Morrisville community since almost a third of the respondents rated it as the top priority. Emissions reduction rated second. Renewable energy is rated as the third highest priority. Alternative transportation and food waste/recycling were rated lowest.
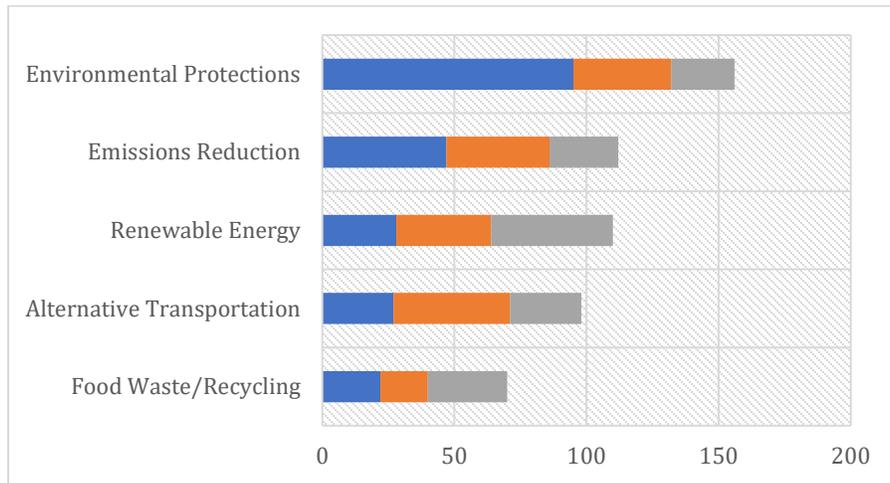

Figure 7: Sustainability priorities rated

The survey also asked for ideas to make Morrisville more sustainable. This question was open to survey takers to provide ideas. Figure 8 shows that renewable energy was the top idea suggested, followed by recycling, protection of the tree canopy, composting food waste, sustainability education, more green spaces, less development, increased bike-ability/walkability, and alternative transportation.
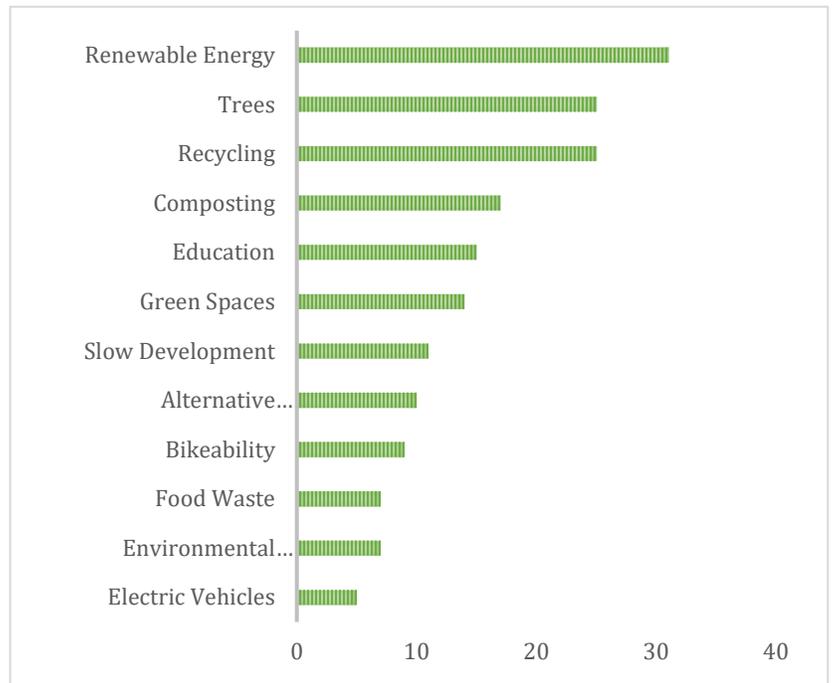

Figure 8: Ideas for a Sustainable Morrisville

Focus Groups

Community engagement included opportunities to generate discussions for select groups within the Morrisville community in a focus group setting. Stakeholders were introduced to the MSP planning process, received a plan progress report, and participated in an interactive version of the survey which revealed priorities and recommended actions during the sessions.

Summary from Focus Groups

The Focus Group sessions were attended by 42 stakeholders. These attendees were specifically recruited to maintain a diverse representation to gain perspective on sustainability priorities, current contributions to sustainability efforts, and their perspective on the most effective way to help mitigate the effects of climate change. The interactive survey results for each of the focus groups, with the number in attendance in parentheses, is shown in Table 9.

Table 9: Summary from Focus Group Session

Focus Group	Sustainability Priorities	Current Contributions (home/work/community)	Mitigate Climate Change
Town Council (7)	Food Waste/Recycling	Recycling	Plant more trees
Community (8)	Emissions Reduction	Recycling	Develop Town Policies / Ordinances that support
Business and Industry (7)	Environmental Protections	Replacing old equipment with more efficient models	Develop Town Policies / Ordinances that support
Sustainability Task Force (14)	Environmental Protections	Recycling	Develop Town Policies / Ordinances that support
Morrisville Environmental Stormwater Committee (6)	Environmental Protections	Recycling and Conserving Water (tie)	Develop Town Policies / Ordinances that support

Sustainability Priorities

Environmental protections and emissions reductions work in tandem as the latter directly supports the former. Of course, reducing the Town's greenhouse gas emissions is only one of many objectives in helping to maintain a healthy, viable environment. The different groups brought their unique perspectives on each of the priorities.

Concerning environmental protections, the STF specifically mentioned:

- Intentional tree protection (mature) during development

- Focus on in-fill for development (increased density)
- Increase park space

The business and industry specific focus group added that environmental protection naturally includes emissions reductions and should also incorporate green building standards for new and re-development that are environmentally conscious and responsible. Alternative transportation is also a concern for business and industry. Anecdotally, it was shared how using public transportation for an employee that lives in Cary and works in Morrisville, can take 1 ½ hours. A lack of public transportation was identified as a hurdle to building sustainable, multi-modal communities.

Additionally, MESC promotes the conservation of water, while the industry specific focus group understands the importance of gains made through increasing efficiency with equipment purchases. These gains reduce overall energy consumption, energy costs and potentially reduce emissions simultaneously.

The community focus group chose emissions reduction for its number one priority including ideas such as:

- Build up (vertically) rather than out
- More walkability and alternative transportation (include EV charging charged w/solar)
- Incentivize businesses to reduce emissions
- Create emissions-saving policies for new construction
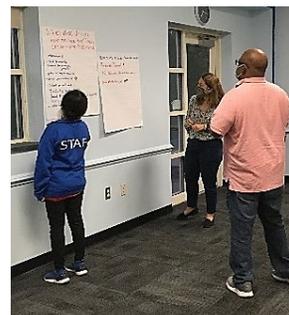
Mitigating Climate Change

Town Council selected 'Plant More Trees' to capture carbon as the number one item to focus on surrounding mitigating climate change. It is important to note, however, that developing Town policies and ordinances that support mitigation and promoting renewable energy and energy efficiency tied for 2nd place.

The remaining 3 focus groups provided a resounding vote toward developing Town policies and ordinances that support mitigation efforts. Additional ideas included expanding the hybrid or electric car implementation for Town vehicles, adding solar to more buildings, and continuing to interconnect neighborhoods to commercial areas to promote accessibility.

PHASE 3
INVESTIGATION & ANALYSIS

Investigation and Analysis

The Investigation and Analysis phase of the MSP development was completed through work with specific Town departments through the STF. During monthly meetings the STF was provided with an update on the MSP. The STF provided feedback on the updates. The following actions were completed and vetted through the STF.

- Criteria Matrix developed for prioritizing projects
- Information gathered in Phases 1 & 2 were reviewed and organized into a snapshot of the five focus areas
- Each focus area was then analyzed for opportunities to increase sustainability and align with existing Town plans
- Findings informed the initial MSP goals and strategies that were then vetted through the STF

Criteria Matrix

The Criteria Matrix shown in Figure 9 will be used to evaluate particular sustainability actions and projects to determine which should be given priority for budgeting and implementation. The Matrix comprises five criteria determined relevant when evaluating potential sustainability projects. The criteria were developed through research of similar tools and input from the STF. Weights were added to each criterion according to its significance to the evaluation process. It is proposed that the matrix be used to evaluate select projects or efforts identified to support the goals and strategies. Stakeholders will be asked to select a weighted priority between 1-10 for each of the criteria. The higher the number, the higher the alignment and therefore, priority. The results will be taken into consideration when evaluating projects alongside budget and other administrative considerations.

Criteria	Weight
Feasibility Are there constraints (operational, political, legal) that might affect the success of the action	25%
Impact How will the action impact goals?	25%
Cost Is there a plan for covering the cost of the action?	20%
Alignment with Other Plans Does the action support other Town goals?	15%
Stakeholder Input Do stakeholders support the action?	15%

Figure 9: Morrisville Criteria Matrix

Analysis

A deep dive into the extensive information gathered during the first two phases provided the context needed to define goals for each of the focus areas.

Analyzed Information

- 2019 Utility Baseline (electricity, natural gas, gasoline, diesel)
- Completed/In-Progress Town sustainability projects
- Alignment with existing plan goals
- Peer Analysis
- Survey findings
- Stakeholder Engagement findings

Goals and strategies were drafted after the analysis was completed. Proposed actions were identified for each of the strategies after reviewing recommended priorities from the survey and the stakeholder engagement sessions. Preliminary goals and strategies were then presented to the STF, and recommended actions were developed. All proposed goals, strategies, and actions can be found in Appendix D, page 63.

Snapshot of Findings

A snapshot of the analyzed information for each of the focus areas is presented over the next few pages. The snapshot contains findings from the following information obtained in Phase 1 and Phase 2:

- ✓ 2019 Baseline
- ✓ Town sustainability projects completed/in-process
- ✓ Peer Analysis
- ✓ Survey
- ✓ Community Engagement
- ✓ Proposed Actions

Electricity Snapshot

2019 Baseline	✓ 2,096,565 kWh ✓ 711 MT CO_{2e} ✓ 30 kW solar capacity
Town Sustainability Projects Completed/ In-Progress	✓ Energy efficiency measures completed in some Town buildings (LED conversions, motion sensors) ✓ Solar installed ✓ Favorable Building Automation System (BAS) pilot results ✓ Fire Station 3 to be completed in 2023 - 24 with efficiency in design ✓ SolSmart Gold Designation
Peer Analysis	✓ Energy reduction goals 3 of 4 peers (100% Clean Energy by 2050) ✓ CO_2 reduction goals ✓ Mayors Climate Protection Commitment Signatory (3 peers)
Survey	✓ Renewable energy was first in response to ideas for improving Town sustainability ✓ Emissions reduction was the second highest response regarding priorities
Focus Groups	✓ Emissions reduction was the highest response regarding priorities
Proposed Actions	✓ BAS system expansion ✓ Additional rooftop solar installations on Town buildings

*Water was not included in Snapshot Findings.

Summary

The analysis of electricity found that it is the highest energy source used, as well as the largest emitter of GHG emissions for the Town. Efficiency measures in buildings, along with the building automation system (BAS), and installed solar are all positive measures to address reduction in electricity consumption. Peers have GHG and energy reduction goals. Emissions reductions ranked high among survey and stakeholder engagement findings. Identified goals are electricity reduction and an increase in renewable energy. Strategies identified include continued improvement of building efficiency, expansion of BAS systems, and installation of additional solar.

Natural Gas Analysis Snapshot

2019 Baseline	✓ 61,226 Therms ✓ 343 MT CO_{2e}
Town Sustainability Projects Completed/ In-Progress	✓ No projects specifically identified with natural gas reduction were found ✓ Baseline research revealed that MAFC uses 84% of the natural gas
Peer Analysis	✓ Energy reduction goals ✓ CO2 reduction goals ✓ Mayors Climate Protection Commitment Signatory
Survey	✓ Renewable energy was first in response to ideas for improving Town sustainability ✓ Emissions reduction was the second highest response regarding priorities
Focus Groups	✓ Emissions reduction was the highest response regarding priorities
Proposed Actions	✓ Possible policies: New Town buildings (electric not natural gas in new construction/recommissioning) ✓ Offset MAFC usage

Summary

Natural gas usage for the Town is minimal other than for the Morrisville Aquatic and Fitness Center (MAFC), which accounts for 84% of usage. The building was recently renovated so further improvements in the short-term are unlikely. On-site solar generation to offset the emissions or the purchase of Renewable Energy Certificates (RECs) are two strategies to address the emissions generated by MAFC.

MAFC was renovated in 2019-20, which has increased utility usage exponentially.

Waste & Recycling Analysis Snapshot

2019 Baseline	✓ 68.64% recycling rate in 2021 ✓ Recycling rate increased 14% since 2019 ✓ 1,410 tons of recycling in 2019
Town Sustainability Projects Completed/ In-Progress	✓ Recycle batteries ✓ Recycling paper (Multiple departments) ✓ Recycle Right Morrisville – Recycling Participation and Contamination Reduction program (RPCR) to increase residential curbside recycling participation and reduce recycling contamination. Campaign goal is 70% participation.
Peer Analysis	✓ Waste diversion goals ✓ Recycling services (expanded to include non-traditional items)
Survey	✓ Compost / food waste
Focus Groups	✓ Town Council #1 Food Waste
Proposed Actions	✓ Decrease printing and paper consumption/Increase paper recycling (convert to paperless/electronic systems to the extent possible) ✓ Re-home surplus ✓ Develop a procedure to ensure current recycling is placed in the recycling dumpster and dumped out of bags ✓ Recycling awards/education – incentivize to boost participation on the front end ✓ Each project includes a recycling evaluation ✓ Ban single use plastics at Town facilities except during emergencies ✓ Install twinned (recycling & landfill) containers around Town ✓ Sustainable procurement of materials for operations and special events

Summary

The baseline review found community recycling has been increasing significantly in the last few years. A waste reduction program was launched in 2021 to encourage the continuation of this trend. The Town is making efforts to reduce and recycle on a departmental level, but there is no comprehensive recycling plan or directive. The service provider does not weigh the waste and recycling which the Town disposes. This poses a challenge for establishing a baseline and assessing progress.

Transportation Analysis Snapshot

2019 Baseline	✓ 54,805 Gallons Gasoline CO2e Emitted: 489 MT ✓ 7,958 Gallons Diesel CO2e Emitted: 81 MT
Town Sustainability Projects Completed/ In-Progress	✓ Telematics on fleet ✓ Fuel efficient fleet vehicles (9 hybrid Police cars) ✓ Hybrid purchase practice for Police vehicles ✓ Idling discouraged (Police) ✓ Electric bikes ✓ EV charging stations ✓ Fleet Management & Utilization Study ✓ EV Infrastructure & Assessment Study ✓ Morrisville Smart Shuttle
Peer Analysis	✓ EV Chargers ✓ Bicycle Friendly America[SM] (3 peers)
Survey	✓ Walkability, Bike-ability, & Alternative Transportation were frequently suggested ideas for a more sustainable Morrisville ✓ Alternative Transportation as a priority #4
Focus Groups	✓ Emissions reduction as a priority #1
Proposed Actions	✓ Hybrids/EVs ✓ Carpool/Motor pool/Share pool ✓ Review 5-year vehicle replacement plan ✓ Discourage idling (incentivize) ✓ Utilize telematics data to establish patterns

Summary

The gasoline baseline found that the Police Department was the primary user. The department has purchased 9 hybrid patrol cars and is discouraging idling. The Town has continued installation of EV charging stations. It is recommended that short-term focus continue to be on hybrid integration, use of Telematics, increased actions to reduce idling, and growth of EV charging infrastructure and vehicles for the fleet.

Built Environment Analysis Snapshot

2019 Baseline	Town building baseline is shown in Energy & Water Analysis
Town Sustainability Projects Completed/ In-Progress	✓ Fire Station 1 has 30 kW solar array ✓ Fire Station 3 design includes the consideration of sustainable features.
Peer Analysis	✓ No peers have green building certifications except for Chapel Hill which is part of the LEED Rating System Compliance Architecture 2030 Challenge
Survey	✓ *Slow building was a reoccurring idea for a more sustainable Morrisville
Focus Groups	✓ Develop Town Policies/Ordinances that support mitigation effort was the #1 response for all stakeholder groups
Proposed Actions	✓ Consider LEED Certification/Green Building Standards ✓ Ensure staff education on green building standards, work with developers ✓ Utilize efficient construction materials and techniques ✓ Sense of community/connection ✓ Density / Intentional Development ✓ Ensure Town policies/ordinances support, encourage/incentivize developers to build sustainably ✓ Build up (vertical) rather than out ✓ Protected bike lanes ✓ Implement **Vision Zero for pedestrian accidents to embrace safe pedestrian crossings to encourage more walkability

*"The Slow building movement aims to slow down the design process in favor of a sustainable design approach that takes more into account than just design program objectives, budget, and schedule."[18] **The Vision Zero Network is a collaborative campaign aimed at building the momentum and advancing this game-changing shift toward safe, healthy, equitable mobility for all.[19]

Summary

The Town is making progress toward building green by incorporating proposed sustainable elements for new buildings such as Fire Station #3 and Public Works. Proposed actions include training staff on LEED or green building requirements, building to green standards, and increasing density. Engagement findings included slowing development and developing Town policies to mitigate climate change. These policies could include green building standards.

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[18] Yudelson, J. 2008. Green Building Revolution. Island Press.
[19] Vision Zero Network. *What is the Vision Zero Network?* Vision Zero Network. 2022. https://visionzeronetwork.org/about/vision-zero-network/

Natural Environment Analysis Snapshot

2019 Baseline	No baseline for this focus area
Town Sustainability Projects Completed/ In-Progress	✓ Tree Ordinance ✓ Greenway system ✓ Monarch Pledge
Peer Analysis	✓ Monarch Pledge (3 peers) ✓ Tree City USA (All) ✓ Bee City USA (1 peer)
Survey Findings	✓ Environmental Protection #1
Engagement Findings	✓ Environmental Protection was #1 for business / industry, STF, MESC, and Survey
Proposed Actions	✓ In-kind preservation (Conservation easement) ✓ Reduce clear-cutting ✓ Update tree ordinance / Offer incentives to developers to increase/save the tree canopy ✓ Parks focused on nature/low impact ✓ Use native plants ✓ Implement a wildflower program along our roadways to improve aesthetics and support pollinators ✓ Partner with local schools to promote walk and bike to school days each year, expand to a monthly walk/bike to school day (tie to Sustainability 101 effort)

Summary

The Town is already taking steps toward protecting its natural environment with tree preservation requirements as part of the UDO, participation in the Monarch Pledge, almost 10 miles of Greenway, and the 140 acres of active parks and managed sites. Environmental protection is a huge priority for all stakeholders. Many actions were proposed around tree protection and native plants.

PHASE 4
GOAL SETTING

Goals, Strategies, and Actions

Goals and strategies for each of the five focus areas were drafted as a result of the findings derived in the Investigation & Analysis phase, as shown in Appendix D, page 63. The STF reviewed initial goals and strategies and offered feedback that strengthened and focused them. The goals, strategies, and actions were then further refined through a series of meetings with Town departments and administration.

Synergy with Existing Town Plans

An evaluation of existing Town plans for sustainability focus areas was conducted as part of this process. This evaluation was completed to ensure the MSP aligned with sustainability elements contained in the existing plans. All the reviewed plans were found to have some sustainability focus. The table below shows each Town plan, the sustainability focus areas found in the plan, its alignment with the five areas of the MSP, the synergy between the two plans, and the Town plan's support of proposed MSP goals.

Town Plan	Sustainability Focus	Focus Area	Synergy Highlights	Supports Proposed MSP Goal
Connect Morrisville Strategic Plan 2021-2024	Goal 1: Improve Transportation Mobility	Transportation	-Enhance mobility options -Develop Infrastructure	• Reduce Gasoline Consumption by 20%
	Goal 2: Thriving Livable Neighborhoods	Energy / Water Natural & Built Environment	-Ensure sustainable development within Town policies / plans	• Reduce Electricity Consumption • Maintain and Nurture Tree Canopy • Native Plant Requirement
	Goal 3: Engaged, Inclusive Community	Built Environment	-Meet needs and interests of community	• Build a Sense of Community
	Goal 5: Operational Excellence	Waste & Recycling	-Enhance comm-facing programs -Leverage the use of technology to enhance efficiency, productivity, and service delivery	• Increase Efficiency Waste / Recycling for Town Operations • Increase Recycling Rate • Food Waste Program

Table 10: Synergy with Existing Town Plans

Town Plan	Sustainability Focus	Focus Area	Synergy Highlights	Supports Proposed MSP Goal
Smart Morrisville Strategy	Intelligent Transportation Balanced Sustainability Engaged Community Enterprise Intelligence	Energy / Water Waste & Recycling Transportation Built Environment	-Advanced transportation capabilities -Solar, EV, and smart bldg. deployments (building automation system) -Open Data Portal/transparency	• Reduce Gasoline Consumption • Reduce Electricity Consumption • Increase Efficiency of Waste / Recycling for Town Operations
Parks + Rec Master Plan	Goal 1: Acquire and Develop Land Strategically to Create Great Park Experiences	Natural & Built Environment	-Connection -Amenities that focus on community interaction -Green infrastructure/materials -Locally sourced materials, solar, green construction	• Build to Green Standards • Build Sense of Community
Comprehensive Transportation Plan	Policy or Program Recommendation	Built Environment Transportation	-Connected greenways, promote human well-being -Permeable pavers, bioswales, trees, ecosystem -EV charging infrastructure	• Build Sense of Community • Reduce Gasoline Consumption • Maintain and Nurture Tree Canopy • Native Plant Requirement
Affordable Housing Study	Recommended Strategies	Built Environment	-Number of 'affordable/workforce' housing units -Reduce energy costs for LMI community through energy efficiency -Green design / construction	• Build a Sense of Community
Land Use Plan	Env. Stewardship Goal	Built Environment	-"Protect and promote Morrisville's unique and sensitive environmental assets and become a recognized community for sustainability and resiliency."	• Build a Sense of Community
UDO Analysis	Policy or Program Recommendation	Waste/Recycling Built Environment Natural Environment Transportation	-UDO Analysis provided by sustainability intern in 2021, outlined several considerations for language alterations in support of increased access to sustainability.	• Increase Efficiency of Waste/Recycling • Incorporate Green Standards in Town projects • Maintain and Nurture the Town's Tree Canopy • Reduce gasoline consumption

Energy & Water

Electricity

Electricity is the largest source of GHG emissions for the Town. It is also the Town's largest energy cost. Electricity has a high emissions factor which means it creates a lot more emissions than other energy sources. For these reasons a priority will be given to electricity goals.

Energy & Water		Strategy	Actions
Goal 1	Reduce electricity consumption 5% by 2026	S1: Increase efficiency of Town buildings and processes	A1: Building energy audits A2: Continued BAS/ implementation A3: Improve efficiency of equipment (mechanical)
		S2: Increase conservation efforts for Departments/ Staff	A1: Energy conservation training program A2: Identify opportunities for conservation
Goal 2	Solar generation of 200 kW by 2026	S1: Identify Town building rooftops compatible	A1: Create a solar plan for implementation A2: Implement solar based on prioritization plan

The first strategy to reduce electricity consumption is to increase the efficiency of Town buildings and processes. Actions to implement this strategy include energy audits of Town buildings, the continued installation of BAS, and energy efficiency upgrades. Previous efficiency measures have been completed in several buildings.

Building Energy Audits

Level 1 energy audits will be conducted internally to identify efficiency improvements that can be managed internally. A Level 1 building audit involves a site walkthrough to identify obvious areas of energy inefficiency. This includes an evaluation of lighting, LED exit signs, door sweeps, occupancy sensors, and programmable thermostats. The audit and installation of noted efficiency measures can be completed internally or by a contractor.

A Level 2 audit would be conducted by a contractor on the most energy intensive buildings to identify building and equipment improvements to increase efficiency. A Level 2 audit evaluates the existing building systems such as HVAC to identify efficiency improvements. A Level 2 audit includes a close examination of the building's energy consumption to identify opportunities for improved efficiency. Building personnel are interviewed for input of building operations and existing issues. Building equipment is evaluated for efficiency.

Building Automation Systems

BAS will be installed in select buildings over the next several years to improve building performance. A BAS is a control system that "consists of sensors and actuators that are programmed using control logic to monitor and regulate operation of building equipment and systems such as HVAC and lighting in a coordinated fashion to optimize performance and energy use."[20] BAS installation and use typically reduces the energy usage in the building by 29%. The buildings identified as the highest users of electricity will be given priority for efficiency improvements and BAS installation. BAS was installed as a pilot at the Public Safety Building in 2022, as well as the completion of a Master BAS Plan to help prioritize implementation.

Energy Conservation Training

Creating a culture of conservation will begin with an energy conservation training program for Town staff. The program will create awareness of the impacts of individual energy usage, and how small changes can reduce consumption. The program will also seek to encourage staff to identify opportunities for both water and energy conservation.

Solar Procurement

The strategy for achieving this goal is to identify Town buildings compatible for solar generation. The actions to identify building compatibility include a review of existing building plans and an evaluation of the roof structure. For structurally appropriate buildings, a solar feasibility study will be conducted and prioritized based on consumption, to determine generation capacity, panel/equipment layout, grid connection, and cost. The information found in the feasibility study will be used to define phased implementation and to develop requests for proposals (RFPs) for appropriate projects.

In June 2021, a solar array was commissioned at Fire Station #1.

The Town has begun integrating solar into its operations with the installation of a 30-kW solar array to offset electricity at Fire Station 1. The Town has selected the Public Safety building as its second solar implementation project scheduled to begin installation in the summer of 2022. Sustainability initiatives have been included in the initial design of the

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[20] Department of Energy, *Report Delves Into the Impacts of Commercial Building Controls on Energy Savings,* Buildings, 2021, https://www.energy.gov/eere/buildings/articles/report-delves-impacts-commercial-building-controls-energy-savings

soon-to-be-built Fire Station 3. The continuation of small building targeted solar projects will provide long-term reductions in the use of non-renewable electricity and emissions.

Renewable Energy Certificates (RECs)

The purchase of RECs is another strategy for reducing the Town's electricity emissions footprint. RECs are "a tradeable, market-based instrument that represents the legal property rights to the renewable-ness – or non-power (environmental, social) attributes - of renewable electricity generation)."[21] "A REC is created for every megawatt-hour (MWh) of electricity that is generated and delivered to the electricity grid from a renewable energy resource. On a shared grid, whether from on-site or off-site resources, RECs are the instrument that electricity consumers must use to substantiate renewable electricity use claims."[22]

The Town can purchase RECs worth one MWh of electricity, and therefore reduce the Town's GHG emissions by the equivalent of one megawatt-hour. Local RECs may be evaluated which would allow the Town to support NC-generated renewable energy.

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[21] EPA, *Offsets and RECs: What's the Difference?* Environmental Protection Agency*, 2021,* *https://www.epa.gov/greenpower*
[22] EPA, *Renewable Energy Certificates,* Environmental Protection Agency, 2021, https://www.epa.gov/greenpower/renewable-energy-certificates-recs

Waste & Recycling

Waste and Recycling goals are broken down into Town operations and community-focused goals. Both Town operations and community goals involve increasing recycling rates. Operations has an added goal of waste reduction, and the community has an added goal of making a food waste program available.

Waste & Recycling		Strategies	Actions
Goal 3	Increase efficiency of waste/recycling of Town Operations	S1: Reduce waste in Town Operations	A1: Develop sustainable procurement policy A2: Develop internal policy for reduction of single-use plastic and printing A3: Evaluate existing surplus policies to increase re-use of assets A4: Internal training
		S2: Increase recycling in Town Operations	A1: Research current process for collection/disposing A2: Develop/implement recycling awards & education A3: Promote recycling in Town buildings through visible receptacles
Goal 4	Increase Community Recycling Rate	S1: Educate residents to increase recycling rate to 70%	A1: Develop communications strategy A2: Promote recycling in Town parks, grounds, and greenways with visible receptacles
Goal 5	Food waste program accessibility	S1: Evaluate food waste programs for the community	A1: Promote food waste program opportunities
		S2: Communicate food waste program to residents	A1: Develop communications strategy (voluntary)

Increase Efficiency of Waste and Recycling of Town operations

There are two strategies for achieving this goal including to reduce waste and increase recycling of Town operations. There are several actions that will be undertaken to reduce waste of Town operations. The development of a sustainable procurement policy will be focused on increasing the sustainability of materials routinely used during events. Reducing single-use plastics in Town facilities (where possible) will help develop a culture of reduce, reuse, recycle which will have a ripple effect. Actions to reduce printing through voluntary commitment, double-sided print defaults, and creating a culture of using electronic files will also be encouraged. Actions are already in place to re-home most surplus property.

To increase recycling of Town operations, it is first necessary to assess the current process for disposing of recycling from can to dumpster to ensure acceptable recyclables are picked up by the service provider. Once the current process is assessed, the Sustainability program will provide education about proper recycling to staff and janitorial contractors. Curriculum will be developed to help educate staff on proper recycling with the intent of creating an incentive through recognition and rewards.

The waste collection provider, GFL, does not collect data on the amount of waste and recycling it collects for Town dumpsters. This makes it difficult to establish a baseline of current waste and recycling quantities, or to determine if actions undertaken to reduce waste and increase recycling are successful. A method for measuring the amount of waste and recycling collected will be researched and evaluated with GFL.

Increase Community Recycling Rate

The strategy is to raise the recycling participation rate to 70% for each of the 5 GFL-served routes. To accomplish this, the Sustainability program will continue to utilize messaging developed through the RPCR program. Residents were sent materials about the program which included a handy magnet depicting recycling do's and don'ts. The waste service provider, GFL, provides monthly reports on recycling weights and rates to monitor program progress. Results and recycling tips will be communicated through Town social media. Research will be conducted on the viability of an app such as Re-Collect, which is a communications app specific to waste and recycling improvement.

To visibly demonstrate the Town's commitment to recycling the Town will have recycling and waste containers twinned, whenever possible. Twinning means that the recycling and waste receptacles are placed together. This encourages a correct decision on the part of the waste thrower. Adding signage with infographics of recyclable items to recycling cans will reduce contamination and serve as a tool to teach what can be properly recycled. Using the term 'landfill' instead of 'waste' to identify the trash receptacle is a particularly effective message.

Food Waste Program Accessible to Residents

Food waste program options will be researched for compatibility with the needs of Morrisville residents. A strategy to communicate the program will then be developed. The feedback received from the survey and focus groups indicated a strong interest in a food waste program. Reducing food waste is seen as one of the best ways to reduce emissions. It is estimated that about 1/3 of the food we buy goes to waste, which accounts for about 10% of global GHG emissions.[23]

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[23] EPA. *Preventing Wasted Food at Home.* Recycle. 2022. https://www.epa.gov/recycle/preventing-wasted-food-home

Transportation

Gasoline is the second highest emitter of GHG emissions for the Town. A goal was established to reduce gasoline 20% by 2026. This goal will be accomplished through the development of a sustainable fleet policy, integration of hybrids and EVs into the fleet, and developing strategies for reduced idling and vehicle miles traveled.

Transportation			
Goal 6	Reduce gasoline consumption by 20% by 2026	S1: Develop sustainable fleet policy	A1: Evaluate hybrid/EV fleet options A2: Evaluate opportunities for a sustainable fleet policy A3: Implement a sustainable fleet policy A4: Develop and implement plan for EV infrastructure A5: Explore internal policies and incentives for increased efficiencies

Policy Recommendations

A sustainable fleet policy will be drafted and recommended to Town Council. A thorough review of the Fleet Utilization & Management Study, as well and the EV Infrastructure & Assessment Study is underway to help fine-tune strategies.

The decision to integrate hybrids and EVs into the fleet will depend on availability of a performance comparable vehicle, charging infrastructure, the cost, and impact to operations. Some fleet vehicles are enhanced for specialized use such as patrol cars and utility trucks. EV or hybrid options may be unavailable or limited or may not meet the performance standards necessary for the use. An option may be available but could be cost prohibitive.

The Police Department consumes 75% of the gasoline since vehicle travel is a primary activity of the department. The department recently added 9 Ford Hybrid Interceptors to its fleet. In comparison to the non-hybrid option of the Interceptor the hybrid has an estimated annual gasoline savings of 1,276 gallons and 22,560 pounds of CO_{2e} according to the manufacturer.[24] An important action will be to continue integrating the Hybrid Ford Interceptors into the Police fleet. Currently there is not an EV option built to meet performance requirements for pursuit rated vehicles.

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[24] Ford Motor Company, *The Ford Police Interceptor Utility,* Ford Police Vehicles, 2021, https://www.ford.com/police-vehicles/hybrid-utility/

Electric Vehicles and Charging

Integrating EVs is an option for fleet vehicles used for local transportation purposes. A plan to integrate them into the fleet will need to include a plan for charging station capacity/location, vehicle user training, and fleet maintenance specialization with EVs. Once this plan is established, EVs will be a regular replacement for appropriate fleet needs.

Tools to Reduce Consumption

Telematics captures real time data about the vehicle such as tire and oil pressure that affect the performance and efficiency, as well as usage data such as speed and idling. A review of telematics data and patterns will be conducted.

Idling can play an unexpectedly high role in increasing gasoline consumption, especially when the vehicle is also used as an 'office'. The Police Department patrol officers spend most of a shift in the patrol car, so idling is inevitable.

Ford Motor Company conducted a comparison of its Interceptor (Police) ICE/Hybrid and determined the hybrid saves 1,276 gallon of gas a year and that 933 of those gallons consumed was from idling.[25] This is because an ICE vehicle consumes gasoline as it idles. A hybrid idles using energy from the battery until it becomes drained, and the ICE is engaged. The potential gasoline savings from idling is why it will be important to continue integrating hybrids into the Police fleet.

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[25] Ford Motor Company, Hybrid Utility Calculator. 2021.
https://www.ford.com/police-vehicles/police-interceptor/hybrid-utility/calculator/

Built Environment

The Built Environment focus speaks to the physical structures that make up the Town. Morrisville has seen rapid development over the last decade, and this is forecasted to continue for the foreseeable future. Concern for the rapid development taking place was expressed by the community in both the survey and the focus group meetings. Two themes emerged from the engagement process - the importance of building to green standards and building a sense of community.

Built Environment		Strategies	Actions
Goal 7	Incorporate green standards in Town projects	S1: Develop policies to support green standards	A1: Research green standards (including sustainable materials) A2: Draft recommendations for policies changes A3: Adopt a green standard policy for Town projects
Goal 8	Build a sense of community	S1: Support intentional development to increase walkability/bike-ability	A1: Support opportunities to promote walkability/ bike-ability within established Town plans/ projects (Town Center, Comprehensive Transportation Plan, etc.)
		S2: Support affordable housing / housing rehabilitation efforts	A1: Support AH efforts A2: Investigate viability of partnership opportunities for housing rehabilitation program for LMI population

Incorporate Green Standards in Town Projects

A strategy to support this goal is to create Town policies that support green standards. One action is to research available standards for building and construction which may include sustainable materials and processes, or techniques to be considered to reduce waste and incorporate sustainable practices. To set an example, the Town can adopt a green standard policy for Town projects. Beyond the goal of green building standards for Town buildings, there was also a lot of community support for stronger green buildings standards for private development within Town limits.

Build a Sense of Community

There was a call for a stronger sense of community and connectedness. Increased walkability and bike-ability were frequently mentioned elements within the Town.

Collaboration with Existing Plans

The new iteration of the STF will provide an opportunity to continue to collaborate on shared goals and objectives across departments. It is intended that the STF meet

quarterly to continue to work toward alignment and engagement on these aspects of the plan.

Affordable Housing

A sense of community also includes affordable housing considerations. Within the Strategic Plan, there are objectives that include increasing the number of affordable/workforce housing units. Additionally, there is an opportunity to support the low-to-moderate income segment by offering housing rehabilitation funds that can be used to increase energy efficiency and reduce utility bills, thereby creating an opportunity for energy equity.

"Energy equity recognizes that disadvantaged communities have been historically marginalized and overburdened by pollution, underinvestment in clean energy infrastructure, and lack of access to energy-efficient housing and transportation. An equitable energy system is one where the economic health, and social benefits of participation extend to all levels of society, regardless of ability, race, or socioeconomic status. Achieving energy equity requires intentionally designing systems, technology, procedures, and policies that lead to the fair and just distribution of benefits in the energy systems."[26]

The Sustainability program will continue to work closely with the Planning department to provide the sustainability perspective with all existing and new affordable housing topics.

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[26] Pacific Northwest National Laboratory. *Energy Equity.* PNNL. 2022. https://www.pnnl.gov/projects/energy-equity

Natural Environment

The Natural Environment includes parks, greenway trails, and green spaces throughout Town. The growth of the built environment over the last decade has reduced the natural environment. Tree protection was one of the most prominent concerns, based on stakeholder engagement, for becoming a more sustainable Morrisville.

Goals		Strategies	Actions
Goal 9	Maintain and nurture the Town's tree canopy	S1: Establish a tree canopy baseline	A1: Collaborate with Wake County on 2022 Land Cover & Tree Canopy Assessment A2: Evaluate results from assessment and develop implementation plan A3: Research requirements and develop plan to become part of national 'Tree City' program
		S2: Identify incentives to save the tree canopy	A1: Evaluate the opportunities to develop incentives to developers to increase canopy
Goal 10	Native plant inclusion for Town projects	S1: Consider Town policy requiring a 70% native plant minimum for required landscaping on Town projects	A1: Develop and implement policy

Tree Canopy

To protect the tree canopy, a first step is to establish a tree canopy baseline. Wake County is in the process of completing a Land Cover Analysis and Tree Canopy Assessment, and there is an opportunity for Morrisville to collaborate on this assessment. Based on the results from the assessment, a canopy protection plan may be developed and implemented. In addition, research will be conducted to determine the requirements to become part of the national 'Tree City USA' program. Developer incentives may be evaluated to help increase or maintain the tree canopy.

Native Plants

There was also support for protecting the Town's natural environment by planting native species of trees, shrubs, and other plant materials and avoiding planting non-native species, especially those deemed invasive. Native species are a good choice since these plants are indigenous to the region and will require less water, fertilizer, and attention to thrive. The community supported a goal to establish a native plant minimum requirement for Town projects and private developers alike. The development of a Town policy, specific to Town projects, will accomplish this goal. The private developer goal may be addressed in the community-wide plan in the future.

GHG Emissions

GHG Emissions		Strategy	Action
Goal 11	Reduce GHG emissions 5% by 2026	S1: Meet yearly goals in Energy/Water & Transportation	A1. Determine if electricity and gasoline reduction goals are met
		S2. Evaluate purchase of Renewable Energy Certificates (RECs) that expand emissions reduction for Town operations	A1. Identify REC options for potential purchase

Strategy 1 provides the primary pathway to 5% reduction in GHG emissions by 2026 by meeting electricity and transportation reduction goals. Strategy 2 provides a secondary pathway to meeting the 5% emissions reduction goal by purchasing RECs.

Electricity Reduction

The electricity goal is to reduce electricity consumption 5% by 2026. To accomplish this goal, twelve buildings were identified for increased energy efficiency measures. The completion of the efficiency measures is expected to reduce energy consumption in the buildings by an average of 15% for a reduction in consumption of 123 MWh or 6% of electricity consumption. This will produce an 82 MT CO_{2e} or 6% reduction. The assumptions and calculations for these reduction strategies can be found in Appendix C.

Gasoline Reduction

The gasoline goal is to reduce gasoline consumption 20% by 2026. To accomplish this goal, the Town will replace Police vehicles annually with hybrid equivalents based on budget allowance and Town Council priorities. For context, if the Town was able to replace 4 vehicles per year, it is estimated to reduce consumption by 4% in the first year. By the end of the implementation period, it is estimated that a 16% reduction will be achieved.

The calculations for the 16% reduction are based on the higher miles per gallon (mpg) of the hybrid compared to an ICE and did not include additional reduction that can be achieved with the hybrids from idling. Hybrids burn significantly less gasoline when idling which adds up when Police vehicles are in use. This reduction in gasoline from idling is estimated at 1% per year. By the end of the implementation period, it is estimated that a 4% reduction will be achieved. This reduction, along with the 16% reduction, will equal a 20% total reduction.

Renewable Energy Certificates (RECs)

This strategy will be used to meet emissions goals not met by Strategy 1. A priority will be given to the purchase of local RECs to support renewable energy growth in the region. RECs should be considered when pursuing self-generation or energy conservation is not an option to meet emissions goal.

Timeline for Implementation

The Timeline for Implementation was based on the Sustainability program being staffed with one full-time staff member. The implementation could be completed in a shorter amount of time if additional resources are allocated. The timeline aspect of this plan will remain flexible to endure potential changes. The Timeline can be found in Appendix D, page 64.

Conclusion and Next Steps

The Town has made significant strides in sustainability. With the addition of this plan, and the approval of the 11 goals, the Town will continue to focus efforts on the initiatives that foster the greatest impact. This plan provides a roadmap to reducing the environmental impacts including the reduction of greenhouse gas emissions and thus supporting global efforts of creating a more sustainable planet.

This purposeful approach to caring for our natural and built environment is an opportunity to create awareness and community engagement for future objectives. The sustainability program will continue to work closely with stakeholders to ensure alignment with community priorities.

The goals within this plan will be documented on an approved publicly accessible dashboard. Major milestones will be updated quarterly for the community to be informed on the program's progress. Meeting or exceeding the goals within the specified timeframe would be indicative of success for the program and the Town broadly.

By communicating the progress of the plan and its milestones, the Town will lead by example. This leadership provides an opportunity for education and awareness for business, non-profit, and residential adoption of sustainable practices.

After the implementation of this plan, the Town will embark on a community-wide greenhouse gas inventory, which will further solidify the Town's commitment to sustainability through education, action, and results. Community goals will be established, tracked and continually communicated to ensure engagement with all Morrisville community members.

Works Cited

Chamber of Commerce, *Best Cities to Live in North Carolina,* Chamber of Commerce*,* 2021, https://www.chamberofcommerce.org/best-cities-to-live-in-north-carolina/

Department of Energy, Report Delves Into the Impacts of Commercial Building Controls on Energy Savings, Buildings, 2021, https://www.energy.gov/eere/buildings/articles/report-delves-impacts-commercial-building-controls-energy-savings

EPA, Offsets and RECs: What's the Difference? Environmental Protection Agency, 2021, https://www.epa.gov/greenpower

EPA. National Recycling Strategy. Environmental Protection Agency. 2022. https://www.epa.gov/recyclingstrategy.

EPA. Preventing Wasted Food at Home. Recycle. 2022. https://www.epa.gov/recycle/preventing-wasted-food-home

EPA, Renewable Energy Certificates, Environmental Protection Agency, 2021, https://www.epa.gov/greenpower/renewable-energy-certificates-recs

Ford Motor Company, The Ford Police Interceptor Utility, Ford Police Vehicles, 2021, https://www.ford.com/police-vehicles/hybrid-utility/

Hill, J., & Kolb, D. Chemistry for Changing Times. Upper Saddle River, NJ 07458: Pearson Prentice Hall

Intergovernmental Panel on Climate Change. About the IPCC. IPCC. 2021. https://www.ipcc.ch/about/

Intergovernmental Panel on Climate Change. Special Report Global Warming of 1.5oC Summary for Policymakers. IPCC. 2021. https://www.ipcc.ch/sr15/chapter/spm/

IPCC, Special Report Global Warming of 1.5^o C Summary for Policymakers, 2018. https://www.ipcc.ch/sr15/

Money, Best Places to Live 2020, Ad Practitioners, 2020, https://money.com/collection/best-places-to-live-2020/5699375/morrisville-north-carolina-2020/

Niche, 2021, Best Places to Live in North Carolina, Niche.com, 2021, https://www.niche.com/places-to-live/search/best-places-to-live/s/north-carolina/

Pacific Northwest National Laboratory. Energy Equity. PNNL. 2022. https://www.pnnl.gov/projects/energy-equity

RTP, Where People + Ideas Converge, RTP, 2022, https://www.rtp.org/

Town of Chapel Hill, 2021, Climate Action and Response Plan, https://www.townofchapelhill.org/Home/ShowDocument?id=48581

Town of Morrisville, 2021, https://www.townofmorrisville.org/

Town of Morrisville, All American, 2021, https://www.townofmorrisville.org/government/all-america-city

Town of Morrisville, History, Town of Morrisville, 2021, https://www.townofmorrisville.org/government/departments-services/fire-rescue/history

Town of Morrisville, Population Estimate 2021, Town of Morrisville, 2021, Internal document.

United States Census Bureau, America: A Nation of Small Towns, 1/5/22: https://www.census.gov/library/stories/2020/05/america-a-nation-of-small-towns.html

United States Census Bureau, Quick Facts, U.S. Census, 2021, https://www.census.gov/quickfacts/fact/table/morrisvilletownnorthcarolina/BPS030220

Vision Zero Network. What is the Vision Zero Network? Vision Zero Network. 2022. https://visionzeronetwork.org/about/vision-zero-network/

Wallet Hub, Best Place to Raise a Family in North Carolina, Wallet Hub, 2021, https://wallethub.com/edu/best-places-to-raise-a-family-in-north-carolina/27861

Appendix A

Utility Data for 2019 Baseline

Department	Town Facility	Electricity (KWh)	Natural Gas (Therms)	Water (Gallons)	Gasoline (Gallons)	Diesel (Gallons)
Administration	Town Hall	184,740		70,804	2,681	
	Connector Bldg	37,360	627	19,970		
	Public Safety Suite B	16,562		52,058		
	Old Engineering Bldg	1,954				
	Administration Building Totals	**240,616**	**627**	**142,832**	**2,681**	**0**
	Chamber of Commerce Pole Light*	4,380				
	Christmas Lights	49				
	Administration Lighting Totals	**4,429**	**0**	**0**	**0**	**0**
	Administration Totals	**245,045**	**627**	**142,832**	**2,681**	**0**
Fire	Public Safety Suite E	21,014		30,998	2,129	6,227
	Fire Station 1 Net Meter	96,200	3,115	289,673		
	Fire Station 2	68,800	4,772	192,756		
	Old Fire Station 1	0				
	Fire Building Totals	**186,014**	**7,887**	**513,427**	**2,129**	**6,227**
Parks & Recreation	Aquatics and Fitness Center	721,881	51,400	33,501		
	Concession Stands (MCP)	53,154		325,017		
	Restroom Bldg (Church Street Park)	46,636		1,623,099		
	Bathroom Bldg (Indian Creek Greenway)	25,942		43,722		
	P&R & Cultural Resources Administration	25,753			985	
	Maintenance Barn	24,359		89,218		
	Storage 219 A	0				
	Senior Center	20,553				
	Maintenance Shed (Church Street Park)	14,146		22,090		
	PVR Comfort Station (NW Park)	10,963		19,748		
	Historic Christian Church	10,831		613		
	Morrisville Community Park (Office, Concession, Bathroo	7,779		38,224		
	Luther Green Community Center (Shiloh Park)	6,771		21,391		
	Concession Stands/SEAS (Shiloh)	4,175		19,535		
	Restroom Bldg (Cedar Fork District Park)	1,764		72,846		
	Farmer Market	0				
	Parks & Rec Building Totals	**974,707**	**51,400**	**2,309,004**	**985**	**0**
	Ballfield Lights	13,700				
	Multipurpose Field Lighting	8,335				
	Parks & Rec Field Lighting Totals	**22,035**	**0**	**0**	**0**	**0**
	5837 Cricket Pitch Way*	7,616				
	Parks Admin Parking Lot*	2,920				
	Town Hall Lights (Indian Creek)*	1,168				
	Lighting (1) LED, (5) HPS*	2,040				
	Lighting (3) LED (NW Park)*	1,752				
	Pole Lights (6) HPS*	5,232				
	Parks & Rec Lighting Totals	**20,728**	**0**	**0**	**0**	**0**
	Parks & Rec Totals	**1,017,470**	**51,400**	**2,309,004**	**985**	**0**
Police	Public Safety Suite C	200,680		144,221	41,183	
	Public Safety EV Charging Station	6,574		471		
	Police Totals	**207,254**	**0**	**144,692**	**41,183**	**0**
Public Works	Public Works	44,991		5,340	7,827	1,731
	Public Works (warehouse)	24,549	1,312	54,279		
	Public Works Building Totals	**69,540**	**1,312**	**59,619**	**7,827**	**1,731**
	Metered Service	125				
	Traffic Signal	2,691				
	Traffic Signal	2,374				
	Public Works Traffic Signals/Other Totals	**5,190**	**0**	**0**	**0**	**0**
	Underground Street Lights*	287,104				
	Street Lights*	71,064				
	Pub WRKS (lighting)*	7,884				
	Public Works Lighting Totals	**366,052**	**0**	**0**	**0**	**0**
	Public Works Totals	**440,782**	**1,312**	**59,619**	**7,827**	**1,731**
Totals	**Town Totals**	**2,096,565**	**61,226**	**3,169,574**	**54,805**	**7,958**

* Duke Energy owned/maintained street lights

*MAFC was under renovation in 2019. MAFC is the highest energy user for the Town, so it is important to include it in the baseline. The baseline was estimated with actual usage for MAFC for 2021. Storage 219 A and Farmers Market show zero. The meters were not operational until summer 2020. The usage isn't enough to warrant the effort to create a baseline.

Appendix B

Town of Morrisville Facility Dumpster Collection

Dumpster Location	Department	Dumpster Size	Disposal	Timing	Units	Cost
Chamber of Commerce	Admin, Police , Fire	95 Gal Residential	Recycle	weekly	1	$ 53.94
		8 CY Front Load SVC	MSW	weekly	1	$ 65.94
Fire Station 2	Fire	06 CY Front Load SVC	MSW	weekly	1	$ 68.93
Church Street Park	Parks and Rec	08 CY Front Load SVC	Recycle	every two weeks	1	$ 42.15
		08 CY Front Load SVC	MSW	weekly	1	$ 82.72
Aquatics & Fitness Center	Parks and Rec	08 CY Front Load SVC	MSW	every two weeks	1	$ 46.38
		95 Gal Residential	Recycle	weekly	1	$ 4.71
Luther Green Center	Parks and Rec	04 CY Front Load SVC	MSW	weekly	1	$ 57.35
		95 Gal Residential	Recycle	weekly	1	$ 4.71
Morrisville Community Park	Parks and Rec	08 CY Front Load SVC	MSW	weekly	1	$ 82.72
Cedar Forks District Park	Parks and Rec	08 CY Front Load SVC	MSW	weekly	1	$ 82.72
		08 CY Front Load SVC	Recycle	weekly	1	$82.72
Morrisville Public Works	Public Works	08 CY Front Load SVC	OCC	monthly	1	$ 22.03
		95 Gal Residential	Recycle	weekly	1	$ 4.71
		08 CY Front Load SVC	MSW	weekly	1	$ 82.72
						$356.60

Appendix C

Goal Calculations and Assumptions

Electricity Reduction Strategy

Assumptions:
- 2,096,565 kWh in 2019 (Total)
- 34% Aquatics Center 721,881 kWh – sunk – RECs/Offsets/Solar
- 17% Streetlights 358,168 kWh – sunk – RECs/Offsets

To reduce electricity usage twelve buildings have been identified for improved efficiency

Building	Electricity Usage
Public Safety (Police)	200,680
Town Hall	184,740
FS#2	68,800
FS#1	96,200
Morrisville Comm. Park	53,154
Public Works	44,941
Connector	37,360
Restroom (Church St.)	46,636
Indian Creek Restroom	25,942
P&R Administration	25,753
Public Safety (Fire Admin)	21,014
Public Safety (Engineering)	16,562

824,782 KWh Total for these buildings

15% reduction through efficiency measures = 123,717 kWh = 6% electricity savings

82 MT Savings GHG = 6%

Gasoline Reduction Strategy

Assumptions:

- Total gallons 2019 = 54,805
- Police Dept = 75% of gasoline footprint = 41,183 gallons
- Average miles driven for Town police vehicles = 12,637
- Average miles per gallon for Town police vehicles = 12.11 mpg
- Difference in MPG between Town current (12.11) and hybrid (24)

Town average miles driven comparison:

12,637/24 (hybrid) = 526.54 gallons

12,637/12.11 (current) = 1,044 gallons

Save 517 gallons of gasoline per year per car

4 car conversion rate per year x 517 = 2,067.91 gallons saved per year

2,067.91/54,804 = 0.0377% reduction in gasoline (yr 1) and 0.19% reduction by year 5

2,068 x8.85 kg CO_{2e} = 18,302/1,000 = 18.30 MT

18 MT YR 1
36 MT YR 2
54 MT YR 3
72 MT YR 4
90 MT YR 5 = **4% reduction GHG**

Master Sustainability Plan: At-A-Glance Goals, Strategies & Actions

Energy & Water		Strategy	Actions
Goal 1	Reduce electricity consumption 5% by 2026	S1: Increase efficiency of Town bldgs. and processes	A1: Building energy audits A2: Continued BAS / ionization implementation A3: Improve efficiency of equipment (mechanical)
		S2: Increase conservation efforts for departments and staff	A1: Energy conservation training program A2: Identify opportunities for conservation
Goal 2	Solar generation of 200 kW by 2026	S1: Identify Town bldg. rooftops compatible	A1: Create a solar plan for implementation A2: Implement solar based on prioritization plan

Waste & Recycling			
Goal 3	Increase efficiency of waste/recycling of Town operations	S1: Reduce waste in Town operations	A1: Develop sustainable procurement policy A2: Develop internal policy for reduction in single-use-plastic and printing A3: Evaluate existing surplus policies to increase re-use of assets A4: Internal training
		S2: Increase recycling in Town operations	A1: Research current process for collecting / disposing A2: Develop / implement recycling awards & education A3: Promote recycling in Town bldgs. through visible / accessible receptacles
Goal 4	Increase community recycling rate	S1: Educate residents to increase recycling rate to 70%	A1: Develop communications strategy A2: Promote recycling in parks, grounds, and greenways with visible / accessible receptacles
Goal 5	Food waste program accessibility	S1: Evaluate food waste programs for the community	A1: Promote food waste program opportunities
		S2: Communicate food waste program to residents	A1: Develop communications strategy (voluntary)

Transportation			
Goal 6	Reduce gasoline consumption by 20% by 2026	S1: Develop sustainable fleet policy	A1: Evaluate hybrid/EV fleet options A2: Evaluate opportunities for a sustainable fleet policy A3: Implement a sustainable fleet policy A4: Develop an implementation plan for EV infrastructure A5: Explore internal policies and incentives for increased efficiencies

Built Environment			
Goal 7	Incorporate green standards in Town projects	S1: Develop Town policies to support green standards	A1: Research green standards (including sustainable materials / techniques) A2: Draft recommendations for policy changes A3: Adopt a green standard policy for Town projects
Goal 8	Build a sense of community	S1: Support intentional development to increase walkability/bike-ability	A1: Support opportunities to promote walkability / bike-ability within established Town plans / projects (Town Center, Comprehensive Transportation Plans, etc.)
		S2: Support affordable housing / housing rehabilitation efforts	A1: Support AH efforts A2: Investigate viability of partnership opportunities for housing rehabilitation program for LMI population

Natural Environment			
Goal 9	Maintain and nurture the Town's tree canopy	S1: Establish a tree canopy baseline	A1: Collaborate with Wake County on 2022 Land Cover & Tree Canopy Assessment A2: Evaluate results from assessment and develop implementation plan A3: Research requirements and develop plan to become part of national 'Tree City' program
		S2: Identify incentives to save the tree canopy	A1: Evaluate the opportunities to develop incentives to developers to increase / save tree canopy
Goal 10	Native plant inclusion for Town projects	S1: Consider Town policy for a 70% native plant minimum for required landscaping on Town projects	A1: Develop and implement policy

Greenhouse Gas Emissions			
Goal 11	Reduce GHG emissions 5% by 2026	S1: Meet yearly goals in Energy/Water & Transportation S2: Evaluate purchase of Renewable Energy Certificates (RECs) that expand emissions reductions for Town operations.	A1: Identify REC options for potential purchase

Master Sustainability Plan: At-A-Glance Timeline for Implementation

2023
- Energy audits (G1 S1.A1)
- Sustainable procurement policy (G3 S1.A1)
- Evaluate hybrid/EV, draft sustainable fleet policy (G6 S1 A1-4)
- Collaborate with Wake County on tree canopy (G9 S1.A1-2)
- Develop policy for native plant inclusion (G10 S1.A1)
- Evaluate REC options for potential purchase (G11 S2A.1)

2024
- Develop internal policy for single-use plastic red. & printing (G3 S1.A2)
- Promote recycling in Town parks, grounds, and greenways through visible receptacles (G4 S1A.2)
- Implement solar (G2 S1.A2)
- Research food waste program opportunities (G5 S1.A1, G5 S2.A1)
- Evaluate hybrid/EV, approve and implement policy (G6 S1 A1-4)
- Identify REC options for potential purchase (G11 S2A.1)
- Develop policy for native plant inclusion (G10 S1.A1)
- Evaluate opportunities for developer incentives to increase and /or save tree canopy (G9 S2.A1)

2025
- Energy audits (G1 S1.A1)
- Promote food waste program opportunities (G5 S2.A1)
- Develop implementation for EV infrastructure (G6 S1.A4)
- Research requirements to apply for Tree City (G9 S1.A3)
- Wake County tree canopy evaluation of results to develop implementation plan (G9 S1.A1-2)
- Implement policy for native plant inclusion (G10 S1.A1)
- Identify REC options for potential purchase (G11 S2A.1)

2026
- Mechanical improvements (G1 S1.A3)
- Implement Solar (G2 S1.A2)
- Promote food waste program opportunities (G5 S2.A1)
- Investigate viability of partnership opportunities for housing rehab. program for LMI (G8 S2.A2)
- Evaluate surplus policies (G3 S1.A3-4)
- Apply for Tree City (G9 S1.A3)
- Develop food waste comms strategy (G5 S1.A1, G5 S2.A1)
- Identify REC options for potential purchase (G11 S2A.1)

2027
- Energy audits (G1 S1.A1)
- Develop recommended incentives to developers to increase and /or save tree canopy (G9 S2.A1)
- Explore internal policies and incentives for increased efficiencies (G6 S1.A5)
- Research green (building) standards for policies, adopt green standard for Town projects (G7 S1.A1-3)
- Identify REC options for potential purchase (G11 S2A.1)
- Implement surplus policy (G3 S1.A3-4)

2028
- Mechanical improvements (G1 S1.A3)
- Draft recommendations for policies, adopt green standard for Town projects (G7 S1.A1-3)
- Propose partnership opportunities for housing rehab. program for LMI (G8 S2.A2)
- Identify REC options for potential purchase (G11 S2A.1)

The following Actions are recurring for the duration of the plan:

- BAS / ionization
- Internal training
- Support opportunity to promote walk/bike-ability within Town plans / projects
- Support Affordable Housing efforts